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T R E A T I S E
O N
C A T T L E.



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A
T R E A T I S E
O N
C A T T L E:

Shewing the most approved Methods of
BREEDING, REARING, AND FITTING FOR USE,

HORSES,		SHEEP,
ASSES,		GOATS,
MULES,		and
HORNED CATTLE,		SWINE;

With DIRECTIONS for
The proper Treatment of them in their several Disorders:

To which is added,
A DISSERTATION ON THEIR CONTAGIOUS DISEASES.

Carefully collected from the best AUTHORITIES, and
interspersed with REMARKS,

By JOHN MILLS, Esq.

Fellow of the Royal Society of London, Honorary Member
of the Dublin Society, of the Royal Societies of Agriculture
at Paris and Rouën, of the Oeconomical Society of
Berne, and of the Palatine Academy of Sciences and
Belles-Lettres.

L O N D O N:

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T R A T T I S

ON

C A T T L E



THE P R E F A C E.

THIS Work was first written several years ago, and delivered to the Publisher, in order to it's being printed then as a Continuation of my System of Husbandry : but, unhappily for Mr. Johnson, a dreadful fire consumed his house in Pater-noster Row, together with his valuable Stock in Trade, and my comparatively insignificant Manuscript. A rough Copy of it chancing, however, to remain among my other papers, for it is seldom that I can rest satisfied with the first writing of any thing that is to be laid before the Public, at his request I sat about recomposing it, as speedily as an infirm state of health, and some unavoidable avocations which intervened, would permit. The Treatise now offered to the Public is the result of that second labour; in the prosecution of which, the most approved writers of different countries, and the practical experience of some judicious friends in this, have been my principal guides. To these last, in particular, I owe an accession of new materials, which were not in my former Copy, and by means of which this is considerably enlarged,

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largèd,—I hope, to the advantage of the Public. Happy shall I esteem myself, if the execution of this part of my undertaking should meet with the same approbation as my Five former Volumes have been honoured with !

Persuaded, as I am, that no people in the world excel, or perhaps even equal, the English in the whole of what relates to the management of Cattle in general; yet, from a conviction that even the most experienced may gather at least useful hints from the different practices of other nations, I have occasionally shewn wherein any such differ from us in matters of importance, pointed out the grounds of that difference, and endeavoured to investigate the reasons on which it is founded. Likewise, wherever I have quoted, or borrowed from either antient or modern writers, I have always mentioned the place referred to; and if, as hath not unfrequently been the case, I have seen cause to differ from them, I have assigned the reasons for my dissent.

It is chiefly, indeed, from what relates to the proper treatment of the various Accidents and Diseases to which all sorts of Cattle are liable, that I flatter myself the greatest utility may be derived from this work; and in that, besides the instructions I have been favoured with by a gentleman of great ability in the practice of Surgery, as well as deeply skilled in Medicine, I am confident, that neither of those excellent writers, Sir John Pringle, Bart. and Mr. Samuel Sharp, will be offended at the liberty I have taken in applying to the brute creation, in similar cases, the

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the plain and easy directions which they have given for the cure of the human species. They, nobly, aim at doing universal good; and will certainly agree with me, that, next to Man, Cattle are justly entitled to our tenderness and care, in return for the essential benefits we receive from them.

This naturally leads me to regret, that we have not in this Country some Institution like that of the Veterinarian School at Lyons, which is, by Royal Authority, under the Inspection of a very able Surgeon and good Physician, M. Bourgelat, of whose superior intelligence the Reader will find repeated proofs in this Work. Humanity is shocked at the barbarity and ignorance of the generality of Farriers; and it were greatly to be wished, that men of education and skill would cease to think the healing of Cattle an object beneath their notice. Almost every nation in Europe now sends pupils to the Royal Veterinarian School at Lyons; and even supposing a pecuniary return to be the principal object aimed at by those who shall have completed their studies in that, or any similar Seminary, it cannot be doubted that their wishes would be amply gratified.

Having before mentioned the Five Volumes of my System of Husbandry, which were published some years ago, I gladly embrace this opportunity to inform the Public, that, the impression being now disposed of, and numbers expressing a desire to see it reprinted, a new Edition of it is now on the point of being sent

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to the Press, in which all possible care has been taken to rectify the errors that have been pointed out, and those which I have myself discovered, in the former Edition; to enrich it with the essential improvements that have since been made in the several branches of Agriculture, particularly the various new Instruments invented for that purpose; to fit it more completely than before, for the use of the *Practical Husbandman*, and, in a word, to render it more worthy of the Notice and Encouragement of the Public,

CON.

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A T R E A.

A TREATISE
T R E A T I S E

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B O O K I.

OF HORSES.

TO treat this subject with the greater clearness and precision, I shall divide it into three general parts, or chapters: The first will contain directions for judging of the qualities of Horses, and consequently for choosing them, from their outward form and appearances; the second will relate to the breeding, rearing, and fitting them for use; and the third, will be appropriated to their several diseases, distinguishing, first, those which proceed from internal causes; and, secondly, such as are external; with the proper methods of cure in either case.

The epidemics, to which all sorts of beasts are exposed, and the best means that experience has hitherto pointed out for guarding against, and curing the infection, will be carefully summed up in a subsequent part of this volume.

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C H A P. I.

How to judge of Horses.

IN order to judge of a Horse from his outward appearance, it is necessary to examine attentively the conformation of his several parts, especially his eyes, his mouth, his neck, his shoulders, and his legs if it be a draught-horse; and also his flanks and croup if it be a saddle-horse: likewise, to observe carefully his manner of standing and of going, his appetite, his defects, and his age.

But as many of those for whom this work is chiefly intended, I mean particularly Husbandmen, may not be acquainted with the various technical terms which must necessarily occur in the course of this subject; and as a horse cannot be described in a manner satisfactory to such readers, without previously explaining the sense of those terms, defining the several parts of his body, and noticing their perfections and defects; it will be proper, before I proceed farther, to give here an explanation of some of the least generally known, though not least important to be understood. To this end, I shall begin with the horse's head, from thence proceed to his body, and, which seems to me the most natural way, though the generality of writers have not observed it, conclude with his extremities, which are the fore and hind trains.

The two parts of a horse's head which answer to the *temples* in man, are called by the same name.

The cavities between the eyes and ears, above the eye-brows, are called the *eye-pits*.

In some cases, two parts only are distinguished in the *eye*, namely, the external and the internal. The former is the outward coat or tunicle, and the latter those parts which are seen by looking into the eye through the crystalline humour, by the aperture of the pupil: but it surely is wrong to extend the meaning of the word pupil to the inside of the eye, as some have done; the pupil being, in fact, only an aperture of the uvea, communicating with the inward parts of the eye.

The parotid glands, which are situated between the ear and the locking of the under jaw, are called the *vives*.

The part which is contained between the eyes and the nostrils is called the *face*, and answers to the part called the nose in man.

The cartilage which forms the circular aperture of the nostrils, and terminates them above and below, is called the *rim of the nostrils*.

The tip of the horse's *nose* is the septum which divides his nostrils, and is formed by the lower parts of the face, terminating at the upper lip. M. de Solleyfel indeed extends the name of nose to that part also of the upper lip which is under the nostrils.

The cavity formed by the two bones of the lower jaw, reaching from the throat to the beard, is called the *channel*; as is also that in which the tongue lies.

With regard to the teeth, which will be more particularly noticed when I come to speak of the

age of horses; different names have been given to the six incisory ones in each jaw.

The two fore teeth are called *gatherers*; those adjoining to the gatherers are called *middle teeth*, and the last on each side are termed the *corner teeth*.

The two canine teeth in each jaw, one on each side, and at some distance from the incisories, are called *tushes*.

The vacant spaces in the two jaws, between the incisory and the maxillary teeth, are called *bars*.

The *crest* is that part of the neck which is terminated or bordered by the mane above, and the throat below.

The *withers* begin where the mane ends, and cover the upper parts of the two shoulders.

The capacity formed by the ribs is called the *chest*; but the lower part of the body is called the *belly*.

The *flanks* are at the extremity of the belly, at the end of the ribs, and under the kidneys: they reach to the beginning of the haunches.

The *haunch* is formed by the bone which, in a horse, terminates the upper part of the flank, and extends to the rump, or croup.

The *rump* extends from the kidneys to the tail.

The *tail* is distinguished into two parts, viz. the *hair* and the *dock*. The *dock* is the fleshy part of the tail without it's hair.

The *buttocks* are situated under the rump and the origin of the tail, and extend to the place where the hind leg joins the body.

To explain the names given to the different parts of the fore legs, we must now return to the *shoulder*. This, among horsemen, includes the *shoulder-blade*, and the *humerus*; consequently the

the parts which answer to the shoulder and arm of a man: for the real arm of a horse seems blended or confounded by the shoulders being united with the body under the same skin.

The *elbow* is placed backward, as in man; but in a horse it is situated opposite to the ribs, at the top of the fore leg, where that leg begins to separate from the body. This is the first joint that appears prominent; for that of the arm, with the shoulder, is hidden by the skin of the animal.

The first part of a horse's fore leg, separated from the body, is called the *arm*, though it answers to what is called the fore-arm in man. The external part of a horse's arm is called the thick part of the arm, and over it's internal surface runs a vein called the *plat vein*.

The joint called the *knee*, is situated at the extremity of the arm, and at the place of the wrist in man; and, when the leg is bent, it forms an angle forwards.

The *shank* is the second part of the fore leg. It begins at the articulation of the knee, and answers to the metacarpus in man. Behind the shank is a tendon which reaches from one end of it to the other, and which is commonly called the *back sinew*.

The *fetlock joint* is the articulation at the lower extremity of the shank: the ankle-joint of a horse.

The *fetlock* is a tuft of hair which covers a kind of soft gristle behind the pastern joint.

The *pastern* is that part of the leg which reaches from the fetlock joint to the foot.

The *coronet* is an elevation at the lower extremity of the pastern, garnished with long hair, which falls round the foot.

The *hoof* is as it were the nail of the horse: the fore part of it is called the *toe*, and it's sides are

6 A TREATISE ON CATTLE.

termed the *quarters*. The hind part of the hoof is a little raised, and divided into two parts, both included under the name of *heel*. They extend to the middle of the under part of the foot, and, re-uniting under the sole, which is as it were the bottom of the foot, form what is called the *frog*. This is a horny substance like the rest of the foot, of which it is indeed a part; but the horn of the sole is harder than that of the frog, and softer than that of the hoof.

To explain the names of the several parts which compose the hind legs, we must return to the buttocks. Each of these contains what is called the thigh in man: therefore the buttock is properly the horse's thigh articulated to the body. It is terminated on the fore part by the *stifle*, which is properly the articulation of the knee, and contains the *knee-pan*. Thus the stifle is placed at the lower extremity of the haunch, at the beginning of the flank, and changes it's place as the horse moves.

The upper part of a horse's hind leg, when detached from the body, is called the *thigh*: it extends from the stifle and extremity of the buttocks to the ham, and answers to the leg in man. Accordingly there is on the thigh of a horse, a fleshy part resembling the calf of a human leg. On the inward surface of the thigh runs a vein called the *crural vein*.

The *ham*, or *hock*, is the joint which bends forward at the extremity of the thigh. This articulation corresponds with the tarsus in man. The hinder part of the joint called the *point of the hock*, is properly the heel. What is commonly called the *great sinew*, which terminates at the point of the hock, is a tendon answering to the *tendo Achillis* inserted in the human heel.

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The *cheshnut* is a little bare knob in each of the legs of a horse, of the consistence of soft horn, about the bigness of a chesnut, and nearly of the same figure; from whence it has it's name. In the fore legs, it's position is within the arm, a little above the knee, and on one side of it; but in the hind legs, a little below the ham, and on one side of it, also on the internal part. In some horses it grows to the length of an inch, or an inch and a half, and then falls off, but soon after shoots out again.

Under that part of the hind leg which is called the hock, is the *shank*, then the *pastern joint*, next the *pastern*, and then the *foot*, as in the fore legs.

After this explanation, it is of little consequence whether the horse be divided into three principal parts, viz. the fore-hand, the body, or carcase, and the hind-hand; or into four, viz. the head, the body, the fore-train, and the hind-train; * it being sufficient to know what particular part is meant when it is named, and, which I shall next endeavour to point out, when it is named, to be able to judge from the appearance of that part, whether it is, or is not, properly formed.

In a fine horse, the head must be lean and slender, and not too long; the ears small, erect,

* In the former of these divisions, the fore-hand includes the head, neck, withers, breast, and fore-legs; the body is composed of the back, kidneys, ribs, belly, and flanks; the hind-hand comprehends the rump, haunches, tail, buttocks, stifle, thighs, hocks, and the other parts of the hind legs: and in the latter, where the head alone is considered as one of the four principal divisions, the back, the kidneys, the belly, the ribs, and the flanks compose the body; the fore-train is formed of the neck, the shoulders, the breast, and fore legs; and the hind-train, of the rump, the tail, the haunches, and the hind legs.

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narrow, thin, steady, well placed on the top of the head, and at a proper distance from each other; the forehead narrow; the eye-pits filled; the eye-lids thin; the eyes clear, brisk, and full of fire, rather large than small, and projecting to a level with the head; the eye-balls large; the under jaw bare of flesh and not thick; the nose a little arched; the nostrils large and open; the partition between the two nostrils small; the lips thin, and the mouth of a middling size. The upper part of the crest, where the mane issues, nearest to the withers, should at first rise in a strait line, and afterwards, as it approaches towards the head, form a curve nearly resembling that of the swan's neck; but the under part of the neck should not form a curve, it's proper direction being in a strait line from the chest to the lower jaw, with only a little bending forward; for a perpendicular direction would render the shape of the neck faulty. The upper part of the neck must also be slender, and thin of flesh towards the mane, which should be composed of fine long hair, but not too thick. The neck must be long and raised, but proportioned to the height of the animal; for if it be too long and slender, the horse is apt to toss his head; and when it is too short and fleshy, he is apt to bear heavy on the hand. The attitude of the head and neck contributes more than any other part of the body to give the horse a noble carriage, and the most graceful position of the head is when the face is perpendicular to the horizon. The withers should be raised and sharp; the shoulders thin, flat, and not confined; the back equal and smooth, forming a small convexity during it's whole length, by a rising on each side of the back-bone: the flanks should be full and short; the croup round and full; the haunches plump; the dock, or fleshy part of the

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the tail, thick and firm; the arms and thighs thick and fleshy; the fore part of the knee round; the ham large and rounded; the shank sharp before, and large on the sides; the sinew well detached; the pastern-joint slender; the fetlock thinly garnished with hair; the pastern large and of a middling length; the coronet a little raised; the hoof black, smooth, and shining; the instep high; the quarters round; the heels broad, and somewhat raised; the frog small and thin; the sole thick and concave. *

But as it is in very few horses that all these external perfections are united, and in still much fewer that goodness is joined with them; I shall proceed to what is by far most commonly the case, and accordingly give here, chiefly from M. de Buffon's Natural History and Description of the Horse, with the addition of some very pertinent remarks in the *Maison rustique*, which seem to have escaped the notice of that justly celebrated writer, the result of the observations by which those universally acknowledged excellent judges of horses, M. de Solleysel, M. de Garfaut, and M. de la Guereniere, have pointed out

* The curious, especially the Germans, make an anatomical comparison of the horse with some parts of a woman, and of different animals; and that comparison constitutes the description of a perfect horse. They say then, that a horse, to be good, ought to have three parts of a woman, a wide chest, plump buttocks, and long hair; three of the lion, the stateliness, the boldness, and the fire; three of the bull, the eye, the nostril, and the joint; three of the sheep, the nose, the mildness, and the patience; three of the mule, the strength, the perseverance in labour, and the foot; three of the stag, the head, the leg, and the short hair; three of the wolf, the breast, the neck, and the hearing; three of the fox, the ear, the tail, and the trot; three of the snake, the memory, the sight, the moulding; and three of the hare or cat, the running, the step, and the suppleness. *Mais. Rust. Tom. I, Part I, Liv. III, Chap. I.*

the means of discovering the defects, and judging of the blemishes which disfigure most of these animals, especially in their capacity of saddle-horses; for with regard to such as are intended for the uses of husbandry, which are here my principal object, and by which I mean all such common horses as are employed in the country, for the cart, the plough, the saddle, and sometimes the coach; it is sufficient that they be sound and strong, that they draw well and freely, and that they be not vicious. The delicacy of shape which is required in the former, would render these last absolutely incapable of performing the essential services to which they are destined.

When a horse has a large and square *head*, in which case it is said to be ill shaped, and commonly heavy on the hand, he cannot have an air of dignity or beauty; but he is, from that very circumstance, the fitter for draught. If there be so much fat on it as that he may be classed with those called fat-heads, he will be subject to disorders in his eyes. Another defect is, for the head to be too long. When the tip of the nose is not in a perpendicular direction with the forehead, the horse carries his head ill; and when the upper part of the head rises above the curvature of the neck, the head is said to be ill placed.

From the motion of a horse's *ears* may be gathered a pretty sure indication of his temper and present condition. When he travels, the tip of his ears should be directed forward; for a tired horse flags his ears; and such as are vicious and spiteful, carry one ear forward and the other backward, alternately. All direct their ears towards the place where they hear any noise, and when struck on the back or croup, they turn them backwards. Thick lapping ears are unsightly. When the distance between them is too great, especially

especially at the lower part, they are ill placed; and when they are not nearer to each other at the tip than at the root, the horse's hearing is defective. Another fault is, for the horse to be continually lowering his ears like a pig.

A low and hollow *front*, or *forehead*, is a great blemish in a saddle-horse; but those which are so made generally work well.

Many hold it to be a defect in a horse which is neither white nor gray, not to have a *star* in the forehead: but we shall soon shew, when we come to speak of the colours of horses, that the want of this mark, is not in reality any defect at all, and that it is easily made by art.

A horse with a large *eye*, projecting as it were out of his head, has a dull and stupid look; and small hollow eyes, besides giving him a melancholy aspect, never enable him to see well: but yet it would be wrong absolutely to reject a common horse for either of these imperfections, or for his having high eyebrows, which are looked upon as a mark of spitefulness; because those which are so made, commonly labour well and long.

Great accuracy is requisite in examining a horse's eyes, in order to be assured that his sight is good; for they are subject to several defects, which it is sometimes very difficult to discover. The person who examines them should stand near the light, but at the same time take care that he himself be shaded. The common practice of moving the hand before the eye, to observe whether the horse will shut it, is but a doubtful trial; as the impression of the air agitated by that motion, may make the horse close his eye without his perceiving any object: neither is the custom of looking at the eye, to see whether the cornea reflects objects like a mirror, much more
to

to be depended on; because this effect will be produced if the cornea is bright, which it may be in a very bad eye, even without being transparent. It is therefore necessary to be sure of this transparency, or, in other words, to know whether the vitreous humour be turbid, or of a bad colour, instead of being clear and transparent; for in order to afford a distinct view of the pupil, it must be diaphanous. When the vitreous humour is turbid or suffused, it is an indication of the horse's being subject to fluxions. If this disease has vitiated the eye to a certain degree, it will be smaller than the other; which shews that it wastes, and consequently is absolutely spoiled. An eye may indeed be good, though apparently smaller than the other, from the pupil's having been contracted by some accident; but then it is neither turbid nor brown. If a small white spot, called by horsemen the *dragon*, be discerned at the hollow of the eye, the sight of the eye is lost beyond recovery; that spot increasing in time so as to affect the pupil. When the pupil appears of a greenish white, it is a defect, though not always attended with the loss of sight; and when there is more white in it than green, the horse is said to have a wall-eye. Sometimes, two or three foot-coloured spots appear above the ball, through the cornea of a sound eye; but these spots cannot be discovered unless the cornea be clear, pure, and transparent. It's appearing double, or of a bad colour, is a sure sign that the eye is not good. Also if the ball of the eye be small, long, and narrow, surrounded with a ring either white or of a greenish-blue colour, the eye may with certainty be deemed bad, and the sight indifferent. The same judgment may likewise be passed, at least generally, on such as are sunk in their sockets, or one of whose balls is smaller than the other.

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There are also temporary diseases, which affect the sight for a time only; such as the strangles, the coming of the foal-teeth, and of the tushes of the upper jaw.

When the two bones of the *under jaw* are too much loaded with flesh, they are said to be square, and considered as a deformity: but if they are too near each other, and the *channel* between them not sufficiently broad or hollow, it is a defect; because the horse, by not being able to bring together the bony sepa of this channel on each side of his throat, which is called *brilding*, is prevented from carrying a fine head, unless the neck be thin in proportion to the contraction of the channel. If any tumor be perceived in this channel, it denotes a disease.

From a horse's *mouth* being too large or too small, arises an inconvenience with regard to placing the bit: in the former case, it comes too near the grinders or maxillary teeth; and in the latter, it either bears on the tushes, or causes humours in the lips. If the *lips* are too large and fleshy, they cover the bars, and hinder the effect of the bit. When the *bars* of the palate are too fat and thick, the horse feels the bit too sensibly: but it is to be observed, that the palate and gums are less fleshy in old horses than in young ones. The bars should be raised, and the channel should be sufficient for containing the tongue within it, so high as to feel the bit. It is a fault for the bars to be too sharp, their sensibility being then too great; and if, on the other hand, they are too low, round, and fleshy, the sensibility is too little. The *tongue* should be proportioned to the capacity of the channel in which it is placed: if it is so thick as to rise above the bars, it is a fault, and hinders the impression of the bit. Horses whose mouths are dry, are not of so good a constitution

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as those whose mouths are cool, and froth with the bit; neither do they feed so quickly, nor with so much appetite. A draught-horse is not, however, to be rejected because he is hard-mouthed; it being often found that some draw the better for it.

The *beard* is also a part which contributes not a little to the goodness of the mouth. If the two bones which compose it are too distant from each other, and too little prominent, it will, from it's flatness, want sensibility; the curb then being only on one of it's sides: but when, on the contrary, they are too near each other, and also project too much, it is too prominent, and consequently too sensible; the curb bearing then only on the middle part. In short, if the beard be either too hairy, or too fleshy, or if it has any callosities or knobs, these are faults, which indicate that the horse has either too little sensibility, or that proper care has not been taken in riding him.

Ill shaped *necks* have been distinguished into three kinds; the *reverted neck*, the *false neck*, and the *inclining neck*: the first is also called the *stag-neck*, being shaped like the neck of that animal, and forming a convexity forward, from the head to the breast: the false neck is strait all along the throat; and behind, above the withers, is a cavity, from whence it is also called the *hatchet neck*: the *inclining neck* is that which seems to incline more to one side than the other, occasioned by a superabundance of flesh on one side near the mane.

A draught-horse is not at all the worse for his neck's being a little thick and fleshy, and frequently he is the better for it's being rather low, and even inclining.

Marex

Mares are the more esteemed for having a somewhat thick and fleshy neck.

Stonehorses have always larger necks than either mares or geldings.

Thick and bushy *manes* which overload the neck, and sometimes even make it incline, are very unsightly.

When the *withers* are too round and fleshy, the shoulders want freedom, and the saddle is apt to rub them, so as frequently to cause very painful and dangerous ulcers: yet horses which are employed in carrying heavy loads should not have the withers too high.

Horses whose points of the *shoulders* are large and round, and the shoulders themselves too large and fleshy, are heavy, apt to stumble, and, unless their shoulders have an easy motion, are proper only for drawing. Those which, besides the above defects, have also the joints on each side of the breast large and prominent, are likewise fit for nothing but draught; for there the weight of their shoulders is of advantage, by enabling them to draw with the greater force; and their being fleshy, helps to preserve them from being galled by the harness so much as they would otherwise be. When they are so narrow and contracted about the shoulders, as that the fore legs almost touch each other at the top, the horse is said to be weak forward; and, in travelling, he is apt to entangle his legs so as to fall. Pinned shoulders, by which is meant those which seem stiff, bound, and motionless, give a heavy and uneasy motion to a horse, and expose him to stumble, and soon spoil his legs: most horses which want flesh on their shoulders are of this kind, and consequently unable to bear any great fatigue; though some, even with such shoulders, carry their feet well,
the

the above motion proceeding only from the arm.

A broad and open *breast* gives a heavy look to large horses; but would not be considered as a defect in those that are slender, the breast in these last being generally too narrow.

Another defect in a saddle-horse is, for the breast to project and hang over much beyond his legs; because he then rests heavily on the hand, especially when he gallops, and is very apt to stumble and fall. But neither of the above is a defect of any consequence in a draught-horse: on the contrary, he perhaps draws the better for both; at least his breast should certainly be wide and open.

The shorter a horse's *back* is, the better he gallops on his haunches, but he does not walk so well; and the rider suffers from the centre of motion being too near the saddle. If the back is long, the horse walks with more ease, having a greater freedom with his legs; but galloping is more difficult to him. A low, or saddle-back, gives a horse lightness, and is an advantage to a fine fore-hand; for his neck is raised, and he carries his head high; but he soon tires, and is unable to bear any considerable weight.

Horses whose *ribs* have not a proper convexity, but seem to hang down, are called flat horses. This defect hinders them from thriving; their belly sags, they are clumsy, short-winded, and never have a handsome rump, though their back may be good.

When the *belly* rises towards the hind-legs, like that of a greyhound, the horse is said to want body, or to be narrow-bellied. Horses of this kind generally eat little, but are seldom deficient in spirit and mettle.

If

If the belly hangs below the ribs, and at the same time is too full, the horse is said to be cow, or pot-bellied. If a horse of this kind be young, eats much, and coughs often, it is to be feared that he will soon be broken winded.

Hollow *flanks* are another deformity; and if the last of the short ribs be at too great a distance from the haunch-bone, or does not come low enough, the horse both gets flesh, and loses it when gotten, with difficulty. Such a horse is said to be too short, or open ribbed.

Horses in general, when they feel a pain in any part of the hinder train, become thin flanked: when their flanks work more than usual, without their having undergone any great fatigue, it is a sign that they are disordered; but if this happens only from a difficulty of respiration when in exercise, the horse is called a *puffer*; or if the defect be less sensible, he is said to be *thick winded*, and is easily distinguished from one whose flank is affected; the throbbing of the flanks ceasing in the puffer whenever he stands still.

Rumps not properly rounded from the reins to the tail, and which, by falling too soon, appear short, are distinguished by the name of *plump-buttocks*. Those which want prominence and extent behind, are called *goose-rumps*; and those whose buttocks are flat, are called *mule-rumps*; but these are defects of no consequence with regard to the goodness of a horse.

When the bones of the upper part of the *haunches* are too prominent in a horse which is not otherwise very lean, he is said to have *high haunches*; but if he be very fat, he is then said to be *cornered*. A flat side and low belly generally produce this defect, which always gives the appearance of leanness. If one of the haunches be lower than the other, the horse is said to be *bip-*
C *shot*.

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Shot. The conformity of the haunches may be judged of by the situation of the hock; for if this be too backward, the haunches are too long, and the horse never has any remarkable degree of strength: if the haunches fall perpendicular on the pastern joint, they are too short, and hinder the flexibility of the ham.

When the *tail* is placed too high, it renders the rump pointed; and when too low, it indicates a weakness in the reins. A horse that closes his tail on one's endeavouring to take it up, may be safely looked upon as vigorous. Those which have but little hair are called *rat-tails*, and looked upon as blemished; as are also those which have short hairs, and whose tails, instead of forming a convexity at the rump, fall down almost perpendicular.

A horse whose *elbow* is too much confined by the ribs, turns his leg and foot outward; and if it be too open, that is at too great a distance from the ribs, he turns them inward: both are symptoms of weakness.

Long legs are the strongest; and short arms the best for motion, and the flexure of the leg. A small arm, besides being unsightly, is a sure indication that the legs want strength.

Large and puffed *knees* denote the leg to be affected; but when they are bare in the middle, they are a certain proof of it; especially when there is good reason to conclude that it has been occasioned by frequent falls, and that the hair has not been destroyed by any other cause. A large knee shews a horse to be heavy. When it naturally bends a little forward, so that the shank is not perpendicular, the horse is said to be *short-armed*; a defect which does not, however, lessen the goodness of a horse: but if this fault has proceeded

ceed from accident, or fatigue, he is said to be *crook-legged*. Legs do not at first become crooked by fatigue, but are strait on the fore-part from the knee to the coronet, like those of goats, and the horse is then said to be *goat-legged*; but if he be worked hard afterwards, the legs, not being able to stretch any farther, bend, and the horse trembles when he makes a step; though he may still do good service, especially if he has large reins. Those legs which bend a little backward at the knee, which is a fault quite opposite to the former, where they bend forward, are called *calves-legs*.

The length of the *legs* should always be proportioned to the stature of the horse; because, when they are too long, he is not sure footed; and when they are too short, he bears heavy on the hand.

The fore-hand of all mares is lower in proportion than that of horses.

In cold and moist countries, too slender a *shank* is looked upon as a mark of weakness in the leg, and particular care should be taken to examine whether there be not any swellings on it; because these indicate diseases of the bone, which are more or less dangerous, according to their situation.

When the *back sinew* is slender, the horse cannot endure much fatigue, but stumbles, and the leg grows round; that is, the sinew no longer appears detached; which is a sure indication of disease. It is therefore necessary to draw the hand along the sinew, to see whether it be in it's natural state, without tumour or obstruction. If it be but a little distant from the bone, the defect is called a calf-leg; and in this case the sinew is slender, and the leg will not long continue sound.

If the finew be too small near the knee, it indicates weakness in that joint: but this is rarely the case.

When the *pastern joints* are small, they are too flexible, and therefore subject to swellings called *wind-galls*. Yet horses of this kind go easier than others, and consequently are fitter for the riding-school and for parade, though good for little in carriages; nor can they easily be made to back in passing descents. When the pastern joint is crowned, that is, when it projects all around beyond the hoof, without being made so to do by any wound or other accident, it indicates the leg to be in a decaying state.

When the *pasterns* are either too small, or too long, and at the same time so ill placed that the fetlock almost touches the ground, it is a sure indication of weakness: but when this part, though long, supports itself in a good position, it is a mark of some strength, especially in the finew, which hinders the fetlock from yielding too much; but the horse is fit only for parade: and in both the above cases he is said to be *long-jointed*; the pasterns being also denominated joints. Horses with too short pasterns are called *short-jointed*. If the knee, the shank, and the coronet of these horses, form one perpendicular line, the horse is said to be upright on his legs. Horses of this kind are apt to stumble and fall, and to become fetlocked, especially if the heel be too high. They are also more uneasy to the rider than the long jointed. In some horses, one side of the pastern is higher than the other; but this is a slight fault, and easily rectified in the shoeing; as may also that which causes a horse to be upright on his legs. The hair on the pastern should not be stiff or bristly, especially near the coronet; because

cause that may probably be owing to a farinaceous disease, called the *crown-scab*.

When the *coronet* projects beyond the foot, it indicates that the latter is withered, or the former swelled. This part of the horse is very much exposed to accidents, particularly from the feet of one that follows, from his own hind-legs striking against the fore, or from frost nails put occasionally in his shoes by unskilful farriers.

A *foot* too small in proportion to the body, is weak, often painful, and generally accompanied with *wire-heels*. If the heel be of a middling size, and the foot thin, it soon becomes hot on a hard road, and in a short time the horse goes lame. When a foot is too large, and the hoof and sole thin, it is called a *fat foot*: this also is weak; and horses which have such feet are dull and heavy.

White *hoofs* are more brittle than those of any other colour, and frequently become very troublesome: but it is easy to foresee this danger, by observing whether they have been broken by the shoe nails.

Circled feet are those where the hoof is hollowed all around by a kind of transversal gutters. This irregularity in the growth of the horny substance, proceeds from a heat and dryness in the foot, and often brings on lameness. When any part of the hoof has been cut off, it is called a *new quarter*. This is a deformity, because the new hoof is more rugged, coarser, and softer than the former.

When the quarters are so close that the hoof, near the fissure of the frog, is too narrow, or when the heels terminate in a point, and are collapsed with each other, the horse is said to be *hoof-bound*: the heels and quarters thus shaped, press on one of the small bones within the foot,

and if they do not render the horse lame, they at least obstruct his going. If the heels are long behind, the foot is too long, and subject to be hoof-bound, which may also produce *sand cracks*, that is, fissures in one of the quarters, where they sometimes extend from the coronet to the lower part of the hoof.

Weak heels yield under the pressure of the body, low heels want thickness, and from either of them may proceed lameness; the heels in both these cases not having sufficient strength, properly to resist the incumbent weight.

When the *hoof* is too much spread at the bottom, and the quarters project, the horse is said to be *flat-footed*, and he often limps, from the frog's bearing on the ground. It is subject to the same inconvenience, and owes its origin to the same cause, as when the horn of the frog is too long. This is called a *fat frog*, and usually attends low heels. A thin, pinched, and dried frog, are symptoms of the horse's being hoof-bound.

When the *sole* is too thin, it is easily injured; and when it is too thick, and projects above the hoof, that is, when the under part of the foot is not hollow, the horse treads on the sole, and consequently must hurt himself, and halt; such horses are fit only for the plough.

What has been said with regard to the shank, the fetlock-joint, the pastern, the coronet, and the feet of the fore legs, being applicable to the same parts of the hind-legs; it remains only to consider the thigh and the hock.

Lean *thighs*, in which the thickest part is not well marked, indicate a weakness in the hinder train; and when the internal parts of the thighs are too near each other, the horse may be suspected of weakness in those parts.

Small

Small *hocks* are weak: fat *hocks* is a name given to those which are too fleshy, and on that account subject to several disorders which affect the legs. When the hocks are too near each other, the hinder parts of the horse are weak, though his back may be good. When they are turned too much outwards, he cannot rest on his haunches, that is, he cannot bring his rump to be lower than his shoulders. Hocks which turn out when the horse travels, always weaken his hinder parts.

If the *fetlock* projects in such a manner that the horse rests only on his toes, it is a fault which increases with age, and is indifferent only when the horse was so originally, and had it from nature.

The legs are to be considered relatively to each other, when the horse stands still; for from thence is known whether his *position* be not defective. Thus, if the fore legs are too much confined at top, the horse cannot go well, and from their too often touching one another when in motion, he may trip and fall. If the hinder feet are placed too forward under the belly, it indicates the horse to be weak or very much tired; because he endeavours to lessen the weight that bears on his fore-legs, by stretching the hinder as far under his body as he is able. When, on the contrary, the hinder feet are placed backwards, so that the root of the tail is not perpendicularly above the hams, but more forward; this situation, though it offends the eye, does not indicate any defect; his haunches may indeed be too long, but this does not hinder his doing his paces well: the hinder train, however, is injured sooner in such a horse as this, than in one of a different make. If the hock is not placed so backward as it naturally should be, and the haunches, hocks, and

legs follow the same direction in a right line, the horse moves with difficulty. Another bad position is, for the fetlock joint to project forward, as if it were dislocated. Horses which rest on their toes, instead of treading flat on the sole, stand in a bad posture; and if they turn their hind feet out, they want strength in the haunches to go well on a descent; nor can they back without difficulty.

Horses which, on being stopped, instead of remaining quiet, move their legs alternately, are suspected of being foundered, or worn out with labour; as are also those which place one of the hind-legs on the toe; or those which put one of their fore-legs forward, and continue in that posture. These signs, however, are not always certain, being also customary in some horses which are turbulent and full of fire; and to others these motions and bad attitudes are natural: besides, they may proceed from lassitude; for this will make some horses hold up one of their fore-legs; it being no uncommon thing for these animals to rest on three legs: but if they rest one of their hind-legs upon the toe, and hold up one of the fore-legs, is an infallible mark that their legs pain them.

The foregoing account of the different parts of the horse's body, will suffice to indicate, pretty nearly at least, from their external appearances, what may be expected from him when in motion, which is the point I shall next speak to; for there it is that this noble animal exerts all his abilities to serve us, and that the most certain judgement can be formed of him.

The most natural of all his paces is, perhaps, the trot; for the walk and the gallop, though much easier to the rider, are the motions which require most pains to render a horse perfect in.

When

When a horse lifts up his foot to walk, the motion must be equally bold and easy, and the knee properly bent; the leg which is lifted up must appear steady; and, when set on the ground, firm; bearing equally in all its parts; nor must the horse's head be at all affected with the motion; for if the leg falls to the ground suddenly, and at the same time the head sinks, there is room to apprehend that this is done, as in fact it most commonly is, to relieve the other leg, as not able alone to bear the whole weight of the body. This is a very great fault: as is likewise the horse's carrying his foot too much out or in; because it falls on the ground in the same manner. It is also to be observed, that bearing on the heel denotes weakness; and on the toe, a forced and tiresome attitude, which the horse cannot bear for any length of time.

The *walk*, though the slowest of all his paces, must be quick, neither too wide, nor too contracted, but perfectly easy, which greatly depends on the freedom of his shoulders, and is perceivable in the manner of carrying his head: if that be high and firm, it is an indication of strength and freedom. When the motion of the shoulders is not sufficiently free, the leg is not lifted high enough, and the horse is apt to stumble, and trip with his foot against the inequalities of the ground; and when the shoulders are still more straitened, so that the legs seem to have no connection with them, he soon tires, frequently falls, and is unfit for any service. A horse should be firm on his haunches; that is, he should raise the shoulder, and lower the haunch when he walks. He should also support his leg, and lift it to a proper height: but if he holds it up too long, or drops it too slowly, he loses all the advantages

advantages of ease, becomes stiff, and is fit only for some ostentatious parade.

The motions of a horse should not only be easy, but at the same time equal and uniform, both before and behind; for if the haunches stagger while the shoulders remain firm, the rider is incommoded by a jolting motion. The same thing happens when the horse moves his hind-leg too far forward, and places it before the track of the fore-foot. Short bodied horses are subject to this fault: those which cut, or strike their legs against each other, are not sure-footed; and, in general, a long bodied horse is most easy to the rider, because, being at a greater distance from the two centres of motion, the shoulders and the haunches, he is consequently less susceptible of their jolts and impressions.

In the *walk*, the horse lifts his legs to but a small height, so that his feet nearly touch the ground. In a *trot*, they are raised higher, and the feet are entirely off the ground. In a *gallop*, they are raised still higher, and the feet seem to rebound from the turf. In a *walk*, it is required that the motion be quick, free, easy, and steady. The *trot* must be firm, quick, and equal, the hinder impelling the fore parts, and, at the same time, the horse must carry his head up, and his body strait; for if the haunches rise and fall alternately at every motion of the trot, and the horse vacillates, he trots ill from weakness: if he throws out his fore-legs, it is also a defect; for the fore-legs should always be on a line with the hinder, and cover them. When one of the hind-legs throws itself forward, if the fore-leg of the same side remains a little too long in its place, the resistance gives an uneasiness to the motions; and for this reason it is that the interval between the two beats in the trot should be short; but how-
ever

ever short it be, by this resistance alone the trot becomes more uneasy than the walk, or the gallop; in walking, the motion is more easy and pleasing, because the distance is less. In the gallop, there is scarce any horizontal resistance, which alone is troublesome to the rider; the reaction of the motion of the fore-legs being almost entirely upwards in a perpendicular direction.*

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* Quadrupeds usually walk by moving one of the fore, and one of the hind legs forward at the same time. The very instant that the fore off-leg is lifted up, the hind near-leg is also moved; and this step being finished, the near fore leg moves in conjunction with the off hind one; and so on alternately. As their bodies bear on four resting points, forming an oblong square, the most commodious manner of motion is a diagonal change of two of them at once; so that the centre of gravity of the animal's body may have but a small motion, and always remain nearly in the line which connects the two resting points that are not in motion in the three natural paces of the horse; the walk, the trot, and the gallop: this rule of motion is always observed, but with the following differences.

In the *walk*, there are four beats in the motion; if the off fore leg moves first, the near hind leg follows instantly after; then the near fore leg moves in its turn, to be immediately followed by the off hind leg. Thus the off fore foot touches the ground first, the near hind foot second, the near fore foot third, and the off hind foot the last; which forms a movement of four beats, and three intervals, of which the first and last are shorter than the other.

In the *trot*, there are only two beats in the motion: if the off fore leg moves first, the near hind leg moves at the same time, without the least interval between them; then the near fore, and the off hind leg, move also at the same time: so that this motion of the trot has but two beats, and one interval: the off fore, and the near hind feet, lighting together on the ground; the near fore foot and off hind foot are also on the ground at the same time.

In the *gallop*, there are usually three beats: but as in this motion, which is a kind of leap, the fore parts do not immediately move of themselves, but are driven by the force of the haunches and hinder parts; if the off fore foot is to stretch beyond the near, the near hind foot must be grounded first, to serve as a fulcrum to this springing motion. Thus it is that the
near

The spring of the hocks has no less share in the motion of the gallop than that of the loins : whilst the loins exert themselves in raising and impelling forward the anterior parts ; the muscle of the hocks, by it's spring, breaks the impetus, softens the shock, and the gallop is easy in proportion as this spring of the hocks is easy and supple : it is also fleet and rapid in proportion to the strength of the muscles of the hocks ; and most equal when the horse bears most on his haunches, and

near hind foot makes the first beat of the motion, and also touches the ground first ; then the off hind leg raises itself jointly with the near fore leg, and they both touch the ground again at the same time ; and lastly, the off fore leg, which moved an instant after the near fore and off hinder legs, touches the ground the last, which makes the third beat. In the gallop, there are therefore three beats and two intervals ; and in the first of these intervals, when the motion is performed with rapidity, there is an instant when all the four legs are off the ground, and the horse's four shoes are seen at the same time. When a horse has supple haunches and hocks, and moves them with swiftness and agility, the motion of the gallop is more complete, and the cadence made at four times. First, he grounds the near hind foot, which denotes the first beat ; next the off hind foot touches the ground, and denotes the second beat ; the near fore foot grounding an instant after, denotes the third beat ; and lastly, the off fore foot, which touches the ground the last, denotes the fourth beat.

When horses gallop, they generally lift the off fore foot up first, in the same manner as they use the same leg in the walk or trot, and by so doing they gain ground ; the off fore leg advancing farther than the near, and being immediately followed by the off hind leg, which also advances beyond the near hind leg ; but the result of this, constantly continued during a long gallop, is, that the near leg, supporting the whole weight, and pushing forward the other, is the most fatigued. It would therefore be right to accustom horses to gallop alternately on the near and off leg ; for by this means they would hold out the longer in this violent motion ; and accordingly it is so practised in the best riding-schools, though perhaps for another reason, which is, that as the horses are often made to shift hands, that is, to describe a circle, the centre of which is sometimes on the off, and sometimes on the near side, they are accordingly taught to gallop sometimes on the off, and sometimes on the near leg.

the

and the shoulders are supported by the muscles of the loins. Horses which lift their fore-legs to an unusual height when they gallop, are not the swiftest goers; for they strike shorter, and at the same time tire themselves sooner. This usually proceeds from a want of freedom in the shoulders.

The walk, the trot, and the gallop, are the most common and natural paces: but some horses have another, which is called the *amble*. It is very different from the three former; and at first sight appears contrary to the laws of mechanism. The motion here is not so swift as the gallop, or even the trot. In this pace, the horse's feet move still nearer to the ground than in the walk, and are more extended: but what is most singular in it is, that the two legs of the same side, for instance, the off hind and fore leg, move at the same time; and then the two near legs, in making another step, move at once; and in this alternate manner the motion is performed: so that the two sides of the body are alternately without support, or any equilibrium between the one and the other, which must necessarily prove very fatiguing to the horse, who is obliged to support himself in a forced oscillation, by the rapidity of a motion in which his feet are scarcely off the ground. In this pace, the farther the hind leg extends beyond the place where the fore leg grounded, the better the horse ambles, and the more rapid is the whole motion. Thus in the motion of the amble, as in the trot, there are only two beats: but this pace can never be performed but upon even ground, and is extremely fatiguing to the horse, though very easy to the rider.* They who are skilled in horsemanship tell us, that horses
which

* The amble has not the roughness of the trot, because, in the amble, both the legs of the same side are lifted up together

which amble naturally never trot; and that they are much weaker than others. Colts, indeed, very often perform this pace; especially when they exert themselves, and are not strong enough to trot or gallop. Most good horses which have been over-worked, and are on the decline, are also observed voluntarily to amble, when forced to a motion swifter than the walk. Upon the whole, the amble may be considered as a defective pace; not being common, and natural only to a very few horses, which, in general, are weaker than others.

But there are still two other paces, which weak or over-worked horses take to of themselves, and are much more faulty than the amble. These, from their defects, have been called broken, dis-united, or compound paces. The first is between the walk and the amble; and the second between the trot and the gallop: both are the effects of long fatigue, or great weakness in the loins. Horses used to carry mails, by being frequently overloaded, take to the former, instead of the trot, when on their decline; and worn-out post horses go into the latter when urged to the gallop.

Another circumstance, and that one of the most essential, to be attended to in the choice of a horse, is his age; to judge of which Mr. de Buffon has likewise summed up, from the best writers on this subject, the following concise but sure rules.

The most certain knowledge of the age of a horse is to be obtained from his *teeth*, of which he has forty, *viz.* twenty-four grinders, or double teeth, four tushes, and twelve fore-teeth: mares have no tushes, or at least very short ones.

gether, so as to form but one motion; whereas in the trot, the fore-leg of the same side is at rest, and resists the impulse during the whole time that the hinder leg is moved.

It

It is not from the grinders that the age is known: but it is discovered, first by the fore-teeth, and afterwards by the tushes. The twelve fore-teeth begin to shoot within twelve days after the colt is foaled. These first, or *foal teeth*, are round, short, not very solid, and are shed at different times, to be replaced by others. At the age of two years and an half, the four middle *fore-teeth* are shed, viz. two in the upper jaw, and two in the lower. In one year more, two others drop out, one on each side of the former, which have already been replaced. When he is about four years and an half old, he sheds four others, always next to those which have fallen out and been replaced. These four foal-teeth are replaced by four others; but these last are far from growing so fast as those which replaced the eight former, and are called the *corner teeth*: they replace the four last foal teeth, and by them it is that the age of a horse is known. They are easily distinguished, being the third, both above and below, counting from the middle of the jaw. They are hollow, and have a black mark in their cavity. When the horse is four years and a half old, they are hardly visible above the gum, and the cavity is very conspicuous: at six and a half they begin to fill, and the mark continually diminishes and contracts till seven or eight years, when the cavity is quite filled up, and the black spot effaced. After eight years, these teeth ceasing to afford any knowledge of the age, it is judged of by the *tushes*, which are four teeth, adjoining to those last mentioned; and, like the grinders, are not preceded by any other teeth. The two in the lower jaw usually begin to shoot at three years and a half, and those of the upper jaw at four; continuing very sharp pointed till six. At ten, the upper seem blunted, worn out,
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and long; the gum contracting as it's years increase. The barer therefore they are, the older is the horse. From ten to thirteen or fourteen years, little can be seen to indicate the age; but at about this last period, some hairs of the eyebrows begin to turn grey. This mark, however, is equivocal, as is also that drawn from the depth of the eye-pits; horses from old stallions, or old mares, frequently having grey hairs in their eyebrows when they are not above nine or ten years old, and hollow eye-pits when they are quite young. In some horses, the teeth are so hard as not to wear, and in such the black spot subsists as long as they live: but the age of these horses is easily known by the hollow of the tooth being filled up, and at the same time the tushes are very long. This is more common in mares than in horses. The age of a horse may also be known, though less exactly, by the *bars* in his mouth, which wear away as he advances in years.

Experience has fully proved, that no indication whatever of the qualities of a horse can be drawn from the *colour* of his coat, as was formerly, for a long time, wrongly imagined: the best judges, and most accurate observers now smile at that antiquated prejudice, and unanimously agree that there are good horses of all colours: so that, in fact, the whole attention due to the colour of a horse, is only so far as relates to what is reputed beauty in him, and, consequently to his price; some colours being highly valued for their singularity: for judgment has never yet been able to make real beauty be preferred to singularity. I should therefore dismiss this subject without any farther notice, were it not that an explanation of the technical terms most commonly employed in describing the different colours of a horse, may not be unacceptable to such readers as are not already

ready acquainted with their meaning. To this end, I shall class them under three general heads, namely, simple colours, by which I mean such as extend themselves all over the horse's body, without any mixture of others; compound colours, that is, those mixed with others; and extraordinary colours, or, in other words, such as are of an uncommon mixture. The simple colours are the white, the dun, the sorrel, the bay, and the black: the compound are the grey, the mouse, and the roan; and the extraordinary comprehend the tyger, the pied, the strawberry, and the flea-bitten. I shall begin with the most common and most natural, which is the bay. Indeed, if we reflect that the yellow, the bay, the brown, or the fallow, are the most usual, and therefore the most natural colours of wild animals; and that the bay, composed of tints of those colours, is the most common to horses, we may readily incline to think that if these creatures were also wild, they would all be bay, at least in our climate. The other colours belong to them only as domestic animals.

The bay resembles in colour a reddish chesnut, with several gradations, distinguished by the following terms; the bright bay, the light and dark chesnut, the brown bay, the yellow bay, the blood bay, and the bright dappled bay. The brown bay is a very dark brown, almost black, except the flanks and the tip of the nose, where the hair has a reddish cast. The yellow bay needs no description. The dappled bays are those whose rumps are marked with a deeper bay than any other part. The term dappled is also applied to chesnuts which are variegated with clearer spots of a brighter bay, or rather to those whose rump is marked with spots of a darker bay. The manes and tails of all bay horses are black. The bright bay

bay used to be accounted phlegmatic, the yellow bay bilious, and the brown bay still more bilious and spirited.

Black horses are little less common than bay ones. They are of three different sorts as to colour, viz. the rusty, the common, and the jet. The first of these has a brown or rusty cast, and is perhaps more properly a species of brown bay. The flanks and extremities of these rusty blacks are of a paler colour than that of the rest of the body; and for this reason they used to be deemed inferior in point of quality to the other blacks. The jet, or bright black, is clear, sleek, and very black. There is likewise a very shining black, which is, in some particulars, distinguishable from the jet.

The *dun* colour is of a yellowish hue. The manes and tails of some of the horses of this colour are white; in others they are composed of dun and black; and in others again they are entirely black. These last, in particular, have always all along the spine of the back to the tail a black list, generally called the mule's list. The dun has also several gradations: that in which the yellow is least prevalent, is called *cream*, and is in fact a dull yellowish white. The bright dun has a little more yellow in it's mixture; the common dun has still more; the golden dun is of a yet brighter yellow; and the dark dun is of a duller or deeper colour.

The *wolf-colour* is of two sorts, clear and dark: both have tinges of dun, and sometimes the mule's list. The dark coloured used to be reckoned the best horses.

The *forrel* is a kind of ruffet bay, or cinnamon colour. There are several gradations of it; namely, the bright *forrel*, resembling the common colour of a cow; the common *forrel*, which is

is a medium between brown and light; the bay sorrel, inclining to red or ruffet; the dark and the dust sorrel, which is very deep and brown. In some of these horses the mane and tail are white, and in others black. The common sorrel used formerly to be held in so high estimation, that the Spaniards were wont to say, proverbially, "a sorrel horse is sooner dead than tired." A lighter colour in it's extremities than in it's body, was looked upon as a mark of weakness. The lighter sorrels were less esteemed, though all reputed good upon the faith of their colour; and the dark or adust were supposed to be melancholic and docile.

The *roan* is a mixture of red and white, or of white, a dull grey, and a bay. It is distinguished into three kinds, the common roan, the red roan, and the dark roan. The head and extremities of horses of this colour are generally white, or, according to some authors, of a dull grey, and the body roan. It used to be taken for granted, that a roan horse must be excellent if his extremities were black.

Grey horses are divided into several sorts, as dappled grey, silver grey, dusty grey, brown grey, &c. according as their coats are more or less intermixed with white and black, bay or brown. Dappled greys are distinguished by several round spots, some blacker, and others whiter, pretty equally scattered over the rump and other parts of the body. The silver greys have very few black hairs, and those thinly sown on a sleek white ground, shining almost like silver. In the dusty greys, there is a considerable mixture of brown and black with the white. White manes and tails are reckoned a great ornament to horses of this colour. The iron grey have a great deal of black, and little white. The nutmeg grey is a

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mixture of bay, black, and white. The vinous grey is all over mixed with bay. The fronted grey has a white coat decorated with dark reddish spots pretty equally dispersed over the head and body. The thrush-grey, so called from it's resemblance to the colour of the bird of that name, has a dirty look, and is composed of a reddish coat thickly intermixed with black and white. The starling-grey, likewise so called from it's similitude to the colours of the bird of that name, has a browner tinct than the dull grey; and the same appellation is still given to it when it has a yet much larger mixture of black. Coal-grey horses have a white or grey coat, with irregularly scattered black spots, as large as the palm of the hand. When these spots are larger than common, the horses so marked are distinguished by the name of *tygers*. Mouse-grey horses have generally black extremities, and the mule's list. White colts are rare; but the bay or black hairs of all grey horses whiten as they advance in years. The antient opinion was, that neither the dappled greys, nor the tygers are so good as the coal-greys; that the silver-greys are dull and phlegmatic; that the thrush-greys are better than the dappled greys; and that the vinous greys are the best of all greys.

The colour called *porcelain* is a grey mixed with spots of a blueish slate colour, not unlike blue and white china. Horses of this colour are scarce, and used to be reckoned good, but capricious.

The *peach blossom* is a mixture of bay, white, and sorrel, in such proportion as to resemble, in some degree, the colour of the blossoms of the peach tree. Horses of this colour were thought to be apt to grow blind.

Pied

Pied horses have a coat of white and other colours, irregularly mixed with large spots. The common pie is white and black; the bay pie, white and bay; and the sorrel pie, white and sorrel. All pied horses were formerly deemed good, because they were pies; and those which had the least white in them were reckoned best.

Now, whatever the colour of a horse be, those which have black manes and tails are most valued, chiefly indeed because they are thought handsomest; and, on the contrary, those whose flanks and extremities are of a colour less deep than that of the body, are least esteemed.

A white mark in the forehead of a horse is called a *star*, and is more or less large: but if it extends from the forehead to the nose, it is called a blaze. This white mark is not pleasing when it interferes with the eye-brows, nor when it reaches to the tip of the nose. The star, the blaze, and the white on the tip of the nose are sometimes found in the same animal. There are several methods of making stars by art, that is, of changing the natural colour of the hair into white; and in particular it may be done either by cutting off the skin, or by burning it; for the hair which grows again, after the wound is healed, will be white. There are also several ways of dying white eye-brows, or grey or white hairs, into bay or black: but this lasts no longer than till snoding time, that is to say, the season when horses change their coats; the new hair being always of it's natural colour.

When the lower part of a horse's leg is white, he is said to be *balzane*, or white-footed: when this white is fringed or irregularly dentilated at the top, it is called a *dentilated balzane*; and if it is spotted with black, it is termed an *ermine*, or *patched balzane*, or an *ermine leg*. If the white reaches

reaches too near to the knee or hock, the horse is said to be too *high shod*: if the lower part of the hind and fore leg of the same side is white, he is said to be but *indifferently marked*; but if the balzanes are on the off fore leg and near hind leg, or on the near fore leg and off hind leg, he is said to be *traversed* or *cross marked*: and lastly, if all the four legs are white, he is said to have four *white stockings*,

It is not possible to describe all the tincts, mixtures, and gradations of the several colours of horses; nor can the size or form of all the spots and marks observed on some of them be minutely defined: but with regard to those in particular of which we have been speaking, and the same is equally applicable to all others, M. de Buffon declares it to be his opinion, that the marks or spots which we see on the face of several horses often deceive us by a false appearance, in that they change the aspect of the animal; and, as it were, disguise him: for instance, horses with a white blaze have been thought capricious; and that for no other reason, than because the contrast of colours gives them a singular appearance, as scars on the face of a man give him a harsher look: and that if a star in the forehead of a horse is accounted a good sign, it is only when it is in the middle, in which situation it is rather a beauty than a defect. As to the white stockings, he thinks that their being so much noticed is owing to their being situated on the legs, by the frequent motion of which they attract the sight more than other spots; and that if they have been generally taken for bad indications, it is only because their white feet, being more conspicuous, seem to pass closer together than those of other colours: hence the notion of these horses being more apt to stumble; whereas those which have stockings on
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all the four legs are not included in this suspicion, there not being the same apparent inequality in their going. But it would be needless to dwell any longer on this subject, and combat prejudices, which the most experienced horsemen have amply refuted. Their examples will be more powerful than reason, to undeceive others; and truth being once known, time alone will gradually extirpate error.

The *feather*, which is reckoned an ornament in a horse, and by some looked upon as a mark of goodness, is a point where the hairs part as from a centre, and revert so as to form a small conic cavity, nearly in the same manner as the petals of a single flower, particularly a pink. The forehead, the breast, and the belly, are the places where these feathers most commonly are; though some horses have them likewise in other parts. Sometimes also two or three of them are seen together on the forehead, or on the hinder bend of the thigh.

The *Roman sword*, so called from it's resemblance to the sword used by the antient Romans, is in fact nothing more than a long feather, or a kind of furrow formed by the hair being inverted, running along the top of the neck, near the mane. This mark is very rare, and accounted a great beauty; for which reason those horses which have it are bought up at almost any rate by those who pique themselves on being uncommonly curious in a horse's coat. A Roman sword on each side of the mane makes a great addition to the price of a horse.

Three farther circumstances, the first highly proper at least, and the two last essentially necessary to be attended to in the choice of a horse, are, it's country and pedigree, if it be a fine horse that is wanted; the uses for which it is fit; and

care to guard against the artifices by which the unskilful are liable to be deceived.

The several breeds of horses have been so much intermixed, and the characters which would otherwise distinguish those of each climate thereby so blended, that long practice, and very great experience, are requisite now to know the horses of different countries. All the information that we can have on this head, is drawn from travellers, and from the writings of the most expert horsemen, such as the duke of Newcastle, Messrs. Garfaalt, de la Gueriniere, Solleysel, &c. and some remarks, communicated by M. Pignerolles, equerry to the king of France, and director of the academy at Angers, to M. de Buffon, whom I still continue to make my principal guide.

The finest horses that we know of are the *Arabian*. They are larger and fuller than the *Barbs*, and not inferior to them in shape. But as few of them, especially of the true mountain breed, are brought into this country, there have not yet been sufficient opportunities for making circumstantial observations on their perfections and defects.

The *Barbs* are more common than the *Arabians* in this part of the world. Their chest is long and slender, and rises beautifully from the withers: they have little manes, the head well shaped, small, and lean; the ears handsome and well placed; the shoulders flat and slender; the withers narrow and plump; the back strait and short; the flank and sides round and not bulging out; the haunches firm and well shaped; the croup generally somewhat long, and the tail pretty high placed; the thigh well shaped, and seldom flat; the legs handsome, well shaped, and without hair at the pastern joint; the foot well made; but the pastern often too long. They are
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of all colours, but most commonly grey. The Barbs are somewhat negligent in their goings; but, when properly encouraged, they shew an amazing swiftness and vigour: they are very light, and fit for running; and seem of all others the most proper to breed from. It might however be wished that they were somewhat taller, the largest being but fourteen hands high; for fourteen hands and an inch is very extraordinary. Experience has shewn that in England, France, &c. they beget colts larger than themselves. The mountain Barbs are accounted the best, and next to them are those of the kingdom of Morocco. The horses of the rest of Mauritania are of an inferior quality, as are likewise those of Turkey, Persia, and Armenia.

The *Turkish* horses are not so well proportioned as the Barbs: their neck is slender, their body long, and their feet are too thin; but yet, notwithstanding these disadvantages, they will endure great fatigue, and are long-winded: nor indeed is this to be wondered at, if we consider, that the bones of all animals are harder in hot climates than in cold ones, and that, therefore, though their shank bones are smaller than those of the horses of this country, their legs are stronger. It is also worth noticing, that the coats of all hairy animals are shorter and smoother in hot countries than in cold ones.

The *Spanish* horses, which are ranked next to the Barbs, have a long thick neck, with a large mane; the head full big, and sometimes the fore-top large; the ears long, but well placed; the eyes full of fire, and the air noble and spirited: the shoulders thick, and the chest broad; the back frequently somewhat low; the ribs round, but the belly often too large; the croup generally round and large, though in some longish; the
legs

legs beautiful and void of hair; the finew well detached; the pastern sometimes longish like that of the Barbs, the foot a little lengthened like that of a mule; and the heel often too high. The fine-bred Spanish horses are plump, nicely set, and place their legs well on the ground; they have also a great deal of motion in their paces, with much agility, fire, and stateliness. They are generally black, or of a light chesnut; though there are some of all the usual colours of horses; but it is very rare to see any of them with white legs or white noses; the Spaniards having such a dislike to these marks, that they never breed from horses which have them. A star in the forehead is all that they require; but they esteem horses of one entire dark colour as much as we disregard them. Both these prejudices, though opposite, are perhaps equally ill founded, there being very good horses with all kinds of marks; and some excellent among those which are all of one colour. The Spanish horses are all marked on the off thigh with the mark of the stud where they were bred. They are, in general, under-sized; though some rise to fourteen hands and one or two inches. Those of upper Andalusia are reckoned the best of all, though they are apt to have too long a head: but this blemish is overlooked in consideration of their excellent qualities, such as courage, gracefulness, obedience, and ambition; and in activity they excel even the Barbs. These advantages recommend them above all other horses in the world, whether for war, for state, or for the riding-school.

The *Italian* horses were formerly much finer than they now are, the studs in Italy having been neglected for some time past. The kingdom of Naples, indeed, still affords fine horses, especially for carriages; but they have, in general,
large

large heads and thick necks: they are also indocile, and consequently difficult to be trained. These defects are, however, in some degree, compensated by the largeness of their size, their spirit, and the beauty of their motions. They affect great stateliness, and are therefore excellent for parade.

The *Danish* horses are so large, and so well set, that they are preferred to all others for coach-horses. Some of them are perfectly well moulded, but, in general, they have a thick neck, broad shoulders, the back somewhat too long and low, and the croup too contracted for the breadth of the chest: however, they all move well, and are in general excellent for war and state. They are of all colours, even the most uncommon; particularly the pye and the spotted.

Germany affords some fine horses; but the generality of them are heavy and thick-winded, though most of them come from Turkish and Barbary horses, of which the Germans have several studs; as they also have of Spanish and Italian horses. They make no figure in hunting or racing; whereas the horses of *Hungary*, *Transylvania*, and some other adjacent countries, are very light and fleet*.

The *Dutch* horses are very good for coaches. The best of them come from Friesland. The

* The Hussars and Hungarians slit the nostrils of their horses, in order, as is said, to mend their wind, and prevent their neighing in the field; it being asserted, that horses whose nostrils have been slit cannot neigh. Whether this operation has in reality that effect, is more than I can pretend to determine. M. de Buffon, who likewise never had an opportunity of examining the fact, thinks it most natural to suppose that the slitting of their nostrils can only weaken their neighing.—The Hungarian, Croatian, and Polish horses are noted for having what is called the mark in all their fore teeth, where it continues till they are very old.

countries

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countries of Bergue and Juliers also breed very good ones.

The *Flemish* horses are greatly inferior to those of Holland; they have generally large heads, broad feet, and their legs are subject to dropsical swellings. The two last are capital faults in coach horses.

France produces horses of all kinds, though not many fine ones. The best French saddle-horses come from the Limousin, are somewhat like the Barbs, and excellent hunters, but of slow growth. They must not be broke young, nor put to any service before they are eight years old. Auvergne, Poitou, and the territory of Morvant in Burgundy also produce very good ponies. But Normandy affords the finest horses, next after those of the Limousin; and if they are not so good for hunting, they are preferable to the rest for war, are better set, and sooner trained. Lower Normandy and the Cotentin are famous for very fine coach-horses; they are lighter, and more spritely than the Dutch horses, though these last are by much the most generally used for carriages in France. Franche-Comté and the Boulonois furnish likewise very good draught-horses: but a general fault in the French horses is, the too great width of their shoulders; whereas those of the Barbs are too narrow.

The finest *English* horses are very like to the Arabians and Barbs in shape: indeed they owe their origin to them: but the head of the English is much larger, though well made, and has a finer fore-top; and their ears are longer, but properly placed. The ears alone would indeed suffice to distinguish an English horse from a Barb: but the greatest difference between them is in their size, English horses being by much the largest

largest and best set. The common height of our horses is about fourteen hands two inches; but even fifteen hands are not a very extraordinary size. They are of all colours and all marks; generally strong, mettlesome, bold, capable of bearing great fatigue, excellent for hunting and racing, especially those of Yorkshire, with which most of the princes in Europe are plentifully supplied: but they want air and agility, and are too stiff, owing to their not having sufficient freedom in their shoulders.

The above enumerated are the kinds of horses with which we are best acquainted: but as some may perhaps be curious to know what travellers have said concerning those of more distant countries, I shall here borrow from M. de Buffon a summary of their accounts.

“ All the islands of the Archipelago * produce very good horses. Those of the isle of Crete were highly renowned among the antients for agility and swiftness; but they are at present very little used in that country itself, on account of the roughness of the ground, and the mountains and precipices with which it almost every where abounds: the fine horses of these islands, and even those of Barbary, are of Arabian extraction. The native horses of the kingdom of Morocco are much smaller than those of Arabia, but very light and vigorous †. Dr. Shaw tells us, in his travels, that Ægyptian and Tingitanian studs are now superior to all those of the neighbouring countries; whereas about a century ago, as good horses were found in every other part of Barbary. The excellence of these Barbs consists, he says, in never making a false step, and in remaining still when the rider alights or drops the bridle:

* See Dapper's *Description of the Islands of the Archipelago*.

† See *l'Afrique de Marmol*, Paris, 1667, Tom II. p. 124.

they have a long pace, and gallop with rapidity; but are not suffered either to trot or to amble; the inhabitants of the country accounting those goings aukward, and even mean. He adds, that the Ægyptian horses are superior to all others for size and beauty: but these, and indeed most of the Barbary horses, owe their origin to the Arabian coursers, which are incontestably the most beautiful and stately animals in the world.

“According to Marmol*, or rather according to Leo Africanus†, for Marmol has here copied him almost word for word, the Arabian horses are descended from the wild horses of the desarts of Arabia, of which there were studs in very antient times, whereby they have been multiplied to such a degree, that all Asia and Africa are full of them. They are so very swift, that some of them will overtake the ostrich. The people of Arabia Deserta, and those of Lybia, breed a great number of these horses for hunting, but never use them either for travelling or for war. They keep them in pastures when there is grass; and when there is not, they feed them with dates and camel’s milk, which renders them vigorous, swift, and thin of flesh. They lay toils for the wild horses, which they eat, and say that the flesh of the young ones is very palatable: these wild horses are smaller than the others, and commonly of an ash colour; though some are white, with the mane and tail very bristly.’ Other travellers have given us some curious accounts relative to the Arabian horses, from which I shall here extract only the principal parts‡.

* *Ibid* Tom. 1. p. 50.

† *Africae Descriptio*, Tom. II. p. 750, 751.

‡ Particularly M. de la Roque, in his *Voyage fait par ordre de Louis XIV.* printed at Paris in 1714, p. 174, *et seq.* and also *l’Histoire générale des Voyages*, Paris 1746, Tom. II. p. 626.

“No Arabian, howsoever poor and indigent, is without horses. They generally ride mares; experience having taught them that they endure fatigue, hunger, and thirst, better than horses: they are also less vicious, more tractable, and not so much given to neighing as horses. They accustom them so much to be together, that great numbers of them are frequently left to themselves, sometimes for whole days, without their kicking one another, or doing themselves the least hurt. The Turks, on the contrary, are not fond of mares; and the Arabians sell them the horses which they do not intend to keep for stallions. It is a very long time since the Arabians began to preserve the breeds of their horses with great care; to which end they keep exact accounts of their generations, alliances, and whole genealogy. They distinguish their breeds by different names, and divide them into three classes: the first is, that of the noble horses descended from a pure and antient breed on both sides: the second is, where the horse is of an antient breed, but not the mare; and the third is that of common horses. These last sell for little; but those of the first class, and even of the second, among which are some not at all inferior to those of the first, bear an excessively high price. The mares of the first, or noble class, are never covered but by stallions of the same rank. They know, by long experience, all the breeds of their own horses, and likewise those of their neighbours; even to the name, surname, coat, marks, &c. of each. When they have not noble stallions of their own to cover their mares, they hire them of their neighbours, and the covering is performed in the presence of witnesses, who sign and seal an attestation of it, before the Emir's secretary, or some other person in office;
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in this certificate they mention the name of the horse and mare, and enumerate their whole pedigree. Witnesses are also called at the foaling of the mare, and these subscribe another certificate, containing a description of the young colt, with the day of it's being foaled. The value of the horse depends upon these certificates, which are delivered to the purchaser. No mares of this first class are sold under five hundred crowns (upwards of sixty guineas) and many sell for a thousand, fifteen hundred, and even two thousand crowns.

“As the Arabians have only a tent for their dwelling, that tent serves them also for a stable. The mare, the foal, the husband, the wife, and children, lie all intermixed in a confused manner; the little children often on the body or the neck of the mare or foal, without experiencing the least inconvenience therefrom; for these creatures remain still and quiet, as if afraid of hurting them; and so accustomed are these mares to this familiarity, that they will bear all manner of play. The Arabians do not beat them, they treat them gently, talk and discourse with them, take a great deal of care of them; they let them always go their own pace, except in cases of necessity; but then, when once they feel their flanks tickled with the stirrup, they instantly set off, and fly with an incredible velocity, leaping like hinds over hedges and ditches; and if the rider happens to fall, they are so well trained, that they stop instantly, even in the midst of the most rapid gallop.

“All the horses of the Arabians are of a middle size, genteely shaped, and rather lean than fat. They dress them very regularly every morning and evening, with so much care, as not to leave the least filth upon their skin: they wash their legs,

legs, together with their manes and tails, which they leave at their full length, and seldom comb for fear of breaking the hairs: they give them nothing to eat in the course of the day, but only make them drink then two or three times, and at sun-set they tie to their head a bag with about half a bushel of well-cleansed barley: thus these horses eat only in the night, and the bag is not taken from them till the next morning, when it is found empty. In the month of March, when there is a sufficiency of herbage, they are turned out to grass. At this season also the mares are covered; and it is the constant practice of the Arabians to throw cold water upon the croup of the mare immediately after the action. When the spring season is over, the horses are taken from the pasture; and during all the rest of the year they have neither grass nor hay, and even straw but very rarely; barley is their only food. The manes of the foals are cut at the age of a year, or eighteen months, that they may grow the closer and longer: they are backed at the age of two years, or two years and a half at farthest; but before that time, neither bridle nor saddle is put upon them. Every day, from morning to evening, all the horses of the Arabians stand bridled and saddled at the door of the tent.

“The breed of these horses has extended itself in Barbary, among the Moors, and has even reached the negroes who inhabit the banks of the rivers Gambia and Senegal, where the lords of the country have some exceedingly beautiful. Instead of barley or oats, they are fed with maize, pounded or reduced to meal, and mixed with milk when it is intended to fatten them: but even in this hot climate they are permitted to drink but seldom*. On another side, the Arabian horses

* See *Histoire générale de Voyages*, Tom. III. p. 297.

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have

have stocked Ægypt, Turkey, and perhaps Persia, where there were formerly very considerable studs; one of which Marco Paulo speaks of*, as containing ten thousand white mares; to which he adds, that there were in the province of Balaschia great numbers of large and swift horses, whose hoofs were so hard that it was needless to shoe them.

“ All the horses of the Levant. like those of Persia and Arabia, have a very hard hoof; yet they are constantly shod, but with thin and light shoes, which may be nailed on in every part. In Turkey, Persia, and Arabia, the manner of tending and feeding horses is the same, and in each of those countries their dung is made to serve for litter, after having been dried in the sun to take off it's smell; when it is pulverized, and spread about four or five inches thick on the floor of the stable or tent. This litter lasts a long time; for when it becomes again offensive, it is dried a second rime in the sun, which entirely takes away it's bad smell.

“ There are in Turkey Arabian horses, Tartar horses, and horses of the native breed of the country: these last are handsome, and very slender†; full of vivacity, remarkably swift, and even graceful; but too tender to bear much fatigue: they eat little, are soon heated, and their skin is so sensible that they cannot bear a curry-comb; for which reason they are only rubbed with a cloth, and washed. These horses, though handsome, are, as we see, greatly inferior to the Arabians: they are even inferior to the Persian

* *Description géographique de l'Inde, par Marc Paul, Venitien, Paris, 1566, Tom. I. p. 41. and Liv. I. p. 21.*

† See *Les Voyages de M. Dumont. La Haye, 1699, Tom. III. p. 253. et seq.*

horses, which are, next to those of Arabia*, the best and most beautiful of any in the East. The pastures in the plains of Media, Persopolis, Ardebil, and Derbeht, are admirably fine, and a prodigious number of horses are reared there, by order of government, most of which are very beautiful, and almost all of them excellent. Pietro della Valle† prefers the common horses of Persia to those of Italy, and even to the most valuable horses of the kingdom of Naples. They are generally of a middle size‡, and some even very small||, which are not for that the less good and strong: but there are also many of a good size, and even larger than the English saddle-horses§. They have all a slender head, a fine neck, and a narrow chest; the ears well shaped and well placed, the legs slender, the rump well turned, and a hard hoof: they are docile, sprightly, agile, spirited, courageous, and capable of enduring great fatigue. They run extremely swift, without ever falling or stumbling; they are robust and very easily fed, barley mixed with fine chopped straw being their only food, which is given them in bags tied to their heads; and six weeks in spring is all the time they are out at grass. Their tails are never cut; geldings are not known among them; clothes are laid over them to prevent their receiving any injury from the air; they are rode only with a snaffle bridle and no spur; and great numbers of them are transported into Turkey,

* See *Voyages de Thevenot*, Paris, 1664, Tom. II. p. 220. Chardin, Tom. II. p. 25. Amst. 1711. and Adam Olearius, Paris, 1650, Tom. I. p. 560. et seq.

† *Voyages de Pietro della Valle*, Rouen, 1745, 12mo. Tom. V. p. 560. et seq.

‡ See *Voyages de Tavernier*, Rouen, 1715, Tom. II. p. 424.

|| *Id. ibid.* p. 220.

§ Chardin, Tom. II. p. 25.

and still more into the Indies. Travellers, who all speak highly of the Persian horses, agree however in saying, that those of Arabia are superior to them in agility, courage, strength, and even beauty; and that the Persians themselves set a much higher value on them, than on the finest horses of their own country.

“ The native horses of India are not good *. Those made use of by the great men of the country, have been carried thither from Persia and Arabia. In the day-time a little hay is given them, and in the evening boiled pease, mixed with sugar and butter, instead of oats or barley. This food supports them, and gives them some strength; for otherwise they would soon waste away, the climate being contrary to their nature. The native horses of the country are, in general very small; some of them even so little, that, if Tavernier may be credited, the young Mogul Prince, who was between seven and eight years of age, usually rode a horse very well shaped, but not bigger than a large greyhound †.

“ Excessively hot climates seem not to agree with horses; as a proof of which, those of the Gold Coast, of Indus, of Guinea, &c. are, like the Indian horses, very bad. They carry their head and neck remarkably low, and totter so greatly in their goings, that one thinks them always ready to fall; they will not stir without continual beating, and most of them are so very low, that the rider's feet almost touch the ground ‡: they are besides very untractable, and indeed fit only to feed negroes, who like their

* See *Le Voyage de la Boullaye-le-Gonz.* Paris, 1657, p. 256, and *le Recueil des Voyages qui ont servi à l'établissement de la Compagnie des Indes*, Amst. 1702. Tom IV. p. 424.

† *Voyages de Tavernier*, Tom. III. p. 334.

‡ *Hist. générale des Voyages*, Tom. IV. p. 228.

flesh as well as they do that of dogs*. Thus we see that the love of horse-flesh is common to the negroes and Arabians: it is likewise so in Tartary, and even in China†.

“The Chinese horses are not better than those of the Indies‡: they are weak, spiritless, ill-shaped, and very small: those of Corea are but three feet high. The Chinese castrate most of their horses; and they are so timid, that they cannot be used in war: accordingly it may be said, that it was the Tartarian horses that conquered China. These last are indeed very fit for war; for though they are generally but of the middle size, they are strong, vigorous, spirited, bold, light, and great runners: their hoof is hard, but too narrow; the head very airy, but too small; the neck long and stiff, and the legs too high: yet with all these defects, they may be accounted very good horses; being indefatigable, and exceeding swift. The Tartars live with their horses nearly in the same manner as the Arabians. When they are seven or eight months old, they put boys on their backs, to walk them about, and gallop them at short intervals. They train them up thus by little and little, and inure them to very short diet; but never mount them for an expedition till they are six or seven years old, and then they are made to endure incredible fatigues, such as marching two or three days without halting, being four or five without any other nourishment than a handful of grass, and at the same time twenty-four hours without drinking, &c.

* *Id.* Tom. IV. p. 353.

† *Voyages de M. Gentil, Paris, 1725, Tom. II. p. 24.*

‡ See *Les anciennes relations des Indes et de la Chine, traduite de l'Arabe. Paris, 1718, p. 204. L'Hist. gen. des Voy. Tom. VI. p. 492, and 505. L'Hist. de la conquête de la Chine, par Palafon, Paris, 1673, p. 426.*

But these horses, which seem, and which are in fact, so robust in their own country, soon fall away to nothing when carried to China or the Indies; though they thrive pretty well in Persia and Turkey.

The inhabitants of Little Tartary have also a small breed of horses, which they value so greatly that they never suffer them to be sold to strangers. These horses have all the good and bad qualities of those of Great Tartary; which proves how far the same usage, and the same manner of bringing up these animals, in part to them the same dispositions and temper. There are likewise in Circassia and Mingrelia numbers of horses which are even handsomer than those of Tartary; and tolerably fine horses are also found in the Ukraine, Walachia, Poland, and Sweden; but particular observations have not yet been made on their good qualities and defects.

“ Now, if we consult the antients with regard to the nature and qualities of horses of different countries, we shall find*, that the Grecian horses, and especially those of Thessaly and Epirus, were in repute, and very good for war; that those of Achaia were the largest then known; that the handsomest of all were those of Ægypt, where they were very numerous, and where Solomon purchased great numbers at very high prices; that horses throve badly in Ethiopia, on account of the too great heat of the climate; that Arabia and Africa furnished the best-made horses, and especially the swiftest and fittest for the saddle or the race; that those of Italy, and particularly of Apulia, were also very good; that in Sicily, Cappadocia, Syria, Armenia, Media, and Persia, there were excellent horses, estimable for their agility and swiftness; that those of Sardinia

* See *Aldrovand, Hist. Nat. de Soliped.* p. 48—63.

and Corsica were small, but spirited and bold; that those of Spain resembled the Parthian horses, and were excellent for war; that the Transylvanian and Walachian horses had small well-shaped heads, manes reaching down to the ground, bushy tails, and were very fleet; that the Danish horses were well made, and good leapers: that those of Scandinavia were small, but well moulded, and very nimble; that the Flemish horses were strong; that the Gauls furnished the Romans with good horses for the saddle, and for carrying burthens; that the German horses were ill-shaped; and so bad as to be of no use; that the Swiss had great numbers of horses, and of very good ones for war; that the Hungarian horses were also very good; and lastly, that the Indian horses were very small and very weak.

“ It results from all these facts, that the Arabian horses have ever been, and that they still are, the first in the world, as well for beauty as for goodness; that it is from them, either immediately, or mediately by the means of Barbs, that the finest horses in Europe, Africa, and Asia, are procured; that the climate of Arabia is, perhaps, the true climate for horses, and the best of all climates for them; since instead of crossing there the native breeds by foreign breeds, great care is taken to preserve them entirely pure; that if that climate is not in itself the best for horses, the Arabians have rendered it such by their particular attention in all times to ennoble the breed, by putting together only such individuals as were the best shaped, and of the first rank; that by an unremitted continuance of this care for several ages, they may have brought the species to a degree of perfection beyond what nature would have done in the best climate. We may also conclude from the above, that those

climates which are rather hot than cold, and especially where the soil is dry, are the best suited to the nature of these animals; that, in general, small horses are better than large; that care is not less necessary to them all than food; that with familiarity and caresses one may obtain much more of them than by force and punishment; that in horses of hot countries, the bones, the hoofs, and the muscles, are much harder than in those of our climates; that though heat agrees with these animals better than cold, yet excessive heat does not suit them; that great cold is likewise hurtful to them; in fine, that their constitution and temper depend almost entirely on the climate, the food, the care taken of them, and the manner of bringing them up."

I now return to the horses of this country, a short sketch of the history of which may not be unacceptable to some readers.

How, or when, this island became provided with the various sorts of animals which we now see in it, is of little importance to the design of this work, or indeed to ourselves. Leaving therefore all the useful kinds, such as bullocks, sheep, hogs, horses, &c. to increase and multiply under the care of the first inhabitants of this country, who, we are told, were careful to bring such with them; and letting polecats, snakes, and toads, with the numerous tribe of other vermin, find their way hither as they can; we shall at once descend to a less obscure period.

When Julius Cæsar invaded this island, he found it's inhabitants abundantly provided with horses so well disciplined as to strike the Romans with admiration, and even terror*; and it is highly probable that these conquerors themselves,

* *Cæsar, de Bello Gallico, Lib. IV. c. 24, 29. Lib V. c. 8, 11, 15.*
during

during their stay here, brought over foreign horses, as well as troops, to maintain the several posts of cavalry which they had formed in different parts, especially on the coasts. The Saxons also kept great numbers of horses in this island, and so likewise did the Danes*: but after the Norman conquest, both the value and the breed of our horses seem to have declined. Henry VII, ever vigilant to promote the welfare of his dominions, and amongst other things to raise at home a good breed of horses, ordered that no stallions should be sent abroad without licence, but permitted the free exportation of low-priced mares when more than two years of age; and his son and successor Henry VIII, made several severe laws against allowing stallions in some places under fourteen, in others fifteen hands high, and about two years old, to run in any forest, moor, or common, where there were mares; commanding magistrates to drive those places about Michaelmas, and impowering and requiring them to put to death all such mares as they should find therein not likely to bear foals of a good size, and all such geldings or foals as they should judge would not prove serviceable. The northern counties were excepted from this order; which shews that they had not at that

* We read in Bromton, that in the reign of king Athelstan, or Ethelstan, a law was made to prevent sending horses abroad for sale; which shews that our horses were in request even at that time. In the year 1000, when Ethelred reigned, it was enacted, that the compensation for a horse that was lost should be thirty shillings, for a mare or colt of a year old twenty shillings. for a mule or young ass twelve shillings, for an ox thirty pence, for a cow twenty four pence, for a sheep one shilling, for a goat eleven pence, for a swine eight pence, and for a man one pound. All this was in Saxon money, of which forty-eight shillings made a pound, and five pence a shilling: and shews us what then was the relative value of things.

time any remarkable breed of horses*. It was enacted, that a certain number of breeding mares, at least thirteen hands high, should be kept in every park where there were deer. These coercive statutes were however so far from answering the purpose for which they were intended, that when we were threatened with the famous Spanish invasion, in the reign of queen Elizabeth, there could not upon the strictest enquiry be found above three thousand horses fit for service in the whole of England†. By the defeat and dispersion of the Armada, the horses on board of that fleet were cast, some upon the shore of Galloway, and other parts of Scotland, by which the native breed of that country was much improved, and from whence it is not at all improbable that some of the Spanish horses were carried into the northern counties of England, where their coming had also the same good effect. The civil wars shewed the use of a superior race of horses, and at length it was perceived, that the true remedy consisted in following the custom of other nations, and that bringing over foreign stallions, attending to the breed, allowing all ranks of men entire liberty in this respect, and encouraging a love for and a pride in good horses, were the only means. The peaceable times which followed, afforded the means of compleating this plan. A little before the resto-

* The case is greatly altered since, particularly with regard to Yorkshire; and to a repeal of this law so far as related to Cornwall, by Stat. 21 Jac. I. c. 28. § 12. we owe the preservation of that valuable race of small horses which the people of that country call Gunhillies, most admirably suited to their roads and labours.

† It cannot indeed be doubted, that one of the principal motives which instigated the Spaniards to that attempt, was the knowledge they had obtained of our weakness in respect to cavalry.

ration, the exportation of our horses was permitted, but under very high duties, and plates were instituted to encourage races. In consequence of these measures, our horses soon became both numerous and valuable; and in the year 1670, the duty on exportation was reduced to a mere register-fee, of only five shillings a head, as it still continues to be. This alteration was speedily attended with all the good effects that could be wished for: fine studs were established in most parts of the kingdom, and supplied plenty of bred-horses for the course, our cavalry, and the saddle; and the spirit of emulation, natural to the inhabitants of this island, extending itself from persons of superior rank and fortune, by whom this work was begun, to the middling class of people, soon procured us other inferior sorts of horses proportionably improved. The notice of all our neighbours was speedily attracted, the reputation of our horses was justly raised, and the advantages resulting from this general regard to these animals became manifest. Whether we have not gone too far in this pleasing road, by over-stocking ourselves with horses, and employing them in works which might be better done by oxen; and whether the object of gain to individuals, by breeding of horses for exportation, may not, all things considered, be a detriment to the nation, are points which have been of late pretty warmly, but, in my humble opinion, not yet satisfactorily discussed. Every one knows, that private benefits may easily arise from public losses.

A mixture of horses of different breeds produces, in our studs, colts which may all be said to differ in size, proportion, temper, instinct, &c. From among this great variety it is that horses are chosen for that purpose to which they seem

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seem best adapted. Thus very different horses are used for travelling, hunting, war, the harness, the pack-saddle, &c.

Saddle-horses for travelling should be in the prime of their age, and of a good size, that they may be the better able to bear the fatigues to which they are destined. They should be sure-footed, their feet well made, their hoofs firm, their mouths sensible, and their motions easy; not too fiery, but quiet without sluggishness. The fearful, and those which are too nice in their food, should be rejected.

All the horses that are trained up for war should be well shaped, vigorous, alert, and lively: their mouths cannot be too good, nor their motions too easy. Their trot and gallop should be short and brisk, and their thighs and backs strong. The horses used by officers should be good-natured, gentle, dexterous, bold, and active: the fearful, or such as are too delicate, or too fiery, are not fit for this service. With regard to troop-horses, it is sufficient that they be strong, hardy, and good trotters; that they have a good share of foot, and a firm mouth.

In state-horses, the only thing attended to is a fine exterior; and accordingly the qualities which chiefly recommend them, are the beauty of their shape, coat, mane, and tail: though it is equally necessary that they should be proud and spirited, their mouth good and frothing, and that they be continually champing the bit. Such as have a proud carriage, have a fine effect in this kind of pomp, where appearances are sufficient.

Stone-horses are reckoned fittest for riding post, because they are best able to endure fatigue. They should be short punch-horses, strong, sure-footed, and so easy in the gallop that their reins be hardly felt. The greatest danger

danger in them is their growing restiff or wanton; but the softness of their mouth, and the elegance of their shape, are of very little consequence.

Hunters should be fleet, active, vigorous, and long-winded, with a good mouth; though too quick a sensation would prove inconvenient on account of the branches of trees which sometimes check the bridle. They should also be cool; for if they were carried away by the noise of the horn and the dogs, it might prove dangerous to the rider. The horses for the whippers-in may be more clumsy and less valuable, but they must be swift and vigorous.

Horses for setting and shooting must be trained up to the sport, and not terrified at the firing of a gun. They are generally of the galloway size, for the more easily mounting them. They must be quiet, without any kind of vice. If they walk well, it is sufficient.

A horse for taking the air is generally chosen of a middle size, rather small than large; the paces of the former being less fatiguing than those of the latter. He should be gentle, and do his paces very well. No remarkable vigour is required: but a sure foot and good mouth are essential.

Coach-horses should trot well, have low haunches, strait backs, and an erect head, with a good mouth, nervous legs, and round feet.

For post chaises, the shaft-horse should be of a good size, well set and long, and he should trot fast and easy; the other, on which the driver rides, may be more slender, but his gallop should be short and easy.

For carts, waggons, drays, the plough, &c. stone-horses of a common breed, and strongly made, are generally preferred. As they draw with a collar, there is a necessity for their being
well

well set; their chest should be large, and their shoulders thick.

Horses for carrying burthens should be well set, with large ribs and firm backs; but the driver's horse should be less clumsy, lighter and more swift, as he often trots. The mouths of these horses should be as hard as the hand that guides them is rough.

The above are the general uses of horses, and the principal qualities required in their respective services. Those of a common breed are not less necessary than the most beautiful, or those remarkable for their swiftness: on the contrary, they are, in fact, more necessary in the essential concerns of life, such as tillage and draught, the labour of which the others are not able to undergo.

C H A P. II.

Of breeding, rearing, and fitting them for use.

TO form a stud properly requires great care and expence. In the establishment of a good one, five things are particularly necessary to be observed: 1, it's situation; 2, the choice of the stallions; 3, the assortment of mares; 4, the covering or copulation of these animals; and 5, the rearing of the colts, and fitting them for use.

The best places for fixing studs in are those which lie open to the east or south, on a dry soil, and are interspersed with hills and dales, and here and there a few clumps of trees. Such are, in general, the whole province of Andalusia in Spain, and most of the countries inhabited by the Arabians, remarkable for producing the finest and best horses. The soil must be good and fertile in grass, and it's extent proportioned to the number of mares and stallions intended to be used. The place thus chosen must be divided into several parts, and each of these must be well fenced with rails and ditches. The part where the pasture is richest should be appropriated to the mares that are in foal, and those with colts by their sides. Those which are not pregnant, or have not yet been covered, should be kept apart with the fillies in another close, where the pasture is less rich, that they may not grow too fat, because this would be a hindrance to their

breed-

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breeding: and lastly, the young stone-colts, or geldings, should be kept in the driest part of the fields, and where the ground is most unequal; in order that, by running over the uneven surface, they may acquire a freedom in the motion of their legs and shoulders. This close, where the stone-colts are kept, must be very carefully fenced off from the others, lest those young horses should break their bounds, and enervate themselves with the mares. If the space be large enough to admit of dividing each of these closes into two parts, so that horses and oxen may be put into them alternately, the pasture will last much longer than if it be constantly fed on by horses only; the ox improving it's fertility, whereas the horse lessens it.

In each of these closes there should be a pond; standing-water being better for horses than running, which last is apt to gripe them, and probably often is the cause of that dreadful disease, the glanders. * They generally prefer water that

* It is worth observing here, that those travellers who speak of the diseases of horses in hot countries, do not say a word of the glanders being so common there as it is in cold climates: from whence there is reason to think, that the coldness of the water may be one of the natural causes of this disorder; these animals being, from the smallness of their mouth, the thickness and shortness of their tongue, and their great eagerness to drink, obliged to dip their nose and nostrils into the water, and to keep them there some considerable time if they would take a plentiful draught; and consequently that this disease might, in some measure at least, be guarded against, by never giving them quite cold water, and always wiping their nostrils after they have done drinking.—Asses are far less subject to the glanders than horses; probably for no other reason than because they drink in a different manner; for the ass, instead of thrusting down his mouth and nostrils into the water, only just touches it with his lips. What would seem to confirm this conjecture is, that the internal structure of both these animals is very nearly alike.

is a little muddy. If there are some trees on the ground, they should be let stand, their shade being both agreeable and serviceable to the horses in great heats; but all stumps should be grubbed up, and all holes levelled, to prevent accidents. Also, it will be right to erect in different commodious parts of the stud a few spacious sheds, for the horses to shelter themselves under in rainy or other bad weather. In these pastures, the horses should feed during the summer; but in winter the mares should be kept in the stable, and fed with hay. Likewise, the colts must be housed, and never suffered to feed abroad in winter, except in very fine weather. Stallions which stand in the stable should be fed more with straw than hay; and be moderately exercised till the season for covering, during which they should have no other exercise, and be plentifully fed; but only with their usual food.

This animal, and especially the female, is capable of engendering at the age of two years, or two years and a half: but the foals begot by such young horses are faulty, either in their shape or in their constitution. A draught, or common horse, should be at least four years or four years and an half old before he is suffered to approach a mare; but those of a more slender and delicate nature should not be admitted to copulation, till they are at least six years old, and the fine Spanish or Arabian stallions not till seven. Mares may be a year younger. Their usual time of heat is from the end of March to the end of June: but the most violent heat seldom lasts above a fortnight or three weeks, and this is the time when they should be led to the horse.

The stallion should be handsome, well-limbed, with a stately chest, vigorous, sound in every part, of a good race and country, and of a proper size, that is, fourteen hands and one or two inches high,

for saddle-horses; and, at least, fifteen hands for coach-horses; for without fine stallions, we cannot expect well-shaped horses. He should also be of a good colour, as a jet black, a fine grey, a bay, a sorrel, a bright chesnut, with the mule's list, the mane and extremities black; for all horses of a dull or faint colour, together with those whose extremities are white, should be excluded from studs. To every external beauty, a good stallion should likewise join all the valuable qualities of a horse, such as courage, docility, mettle, spirit, agility, a sensible mouth, freedom in the shoulders, a sure foot, suppleness in his haunches, a facility of motion in all parts of his body, and especially in the hams. It is also proper that he should have gone through some of the discipline of the riding-school: for it is observed of the horse, which has been more attended to than any other animal, that he communicates, in generation, almost every good quality, whether natural or acquired, as well as, too often, every bad one. For this reason, particular care should be taken to exclude from the stud every defective horse, whether ill-shaped, moon-eyed, glandered, paralytic, &c.

The Arabian, Turkish, Barb, and Andalusian stallions are generally preferred; and next to these the fine English, who owe their origin to one or other of them, and do not soon degenerate, by reason of the excellency of their provender. The stallions of Italy, especially the Neapolitan, are also very good; getting fine-limbed saddle horses, when coupled with mares of that make; and excellent coach-horses with strong well-set mares. It is said, that the Arabian and Barb stallions usually beget horses larger than themselves in England, France, &c. whereas the foals of Spanish horses, in the same countries, are always smaller. The finest coach-horses are bred from the stallions of Naples;

Denmark,

Denmark, or some parts of Germany and Holland, as, in particular, Holstein and Friezland.

In these climates, at least, if not in all others, the mare contributes less than the stallion to the beauty of the foal; but, perhaps more to it's disposition and shape. She should have a large carcase, be pretty full bellied, and a good nurse. The Spanish and Italian mares are generally preferred for breeding of saddle-horses, and the English, Flemish, Danish, and Norman, for coach-horses. However, with fine stallions, fine horses may be expected from mares of all countries, provided they are well shaped, and of a good breed; for if they were got by a bad horse, their foals will often turn out very indifferent. In these animals, as in the human species, the offspring often resemble the progenitors; but in horses the female does not appear to contribute so much to generation as in the human species. A son is much oftener like his mother, than a foal is like it's dam: and when a resemblance happens between the foal and the mare, it is generally in the forehead, the head, and the neck.

It has been observed, that horses fed in dry and light grounds beget temperate, swift, and vigorous foals, with muscular legs and hard hoofs; while the same breed in marshes, and moist pastures, have produced foals with a large heavy head, a thick carcase, clumsy legs, bad hoofs, and broad feet. These differences proceed from the air and food; and so far are easily understood; but what is more difficult to be accounted for, and far more essential in the breeding of horses, is the necessity of continually crossing the breed, to prevent a degeneracy.

To form to ourselves an idea of the expediency of this mixture of breeds, commonly termed *crossing the breed*, let us consider, that nature has,

in every species, a general prototype, after which each individual of that species is formed; and that this, in the realization, degenerates or improves from circumstances: so that, with regard to certain qualities, there is apparently a capricious variation in the succession of individuals; and, at the same time, a remarkable stability in the whole species. The original form subsists entire in each individual: but though there are millions of these individuals, not two of them are exactly alike in every particular; nor consequently any one of them the same as the model from which it received it's form. This difference, which at once demonstrates how far nature is from fixing any thing absolutely, and the infinite variations which she spreads throughout her works, is manifest in the human race, in every species of animals and vegetables, and, in a word, in every series of beings. But what deserves particular attention is, that the model of beauty and goodness seems distributed throughout the whole earth, every climate affording only a portion of it; and that continually degenerating, unless re-united with another portion from some distant country: so that to have good grain, beautiful flowers, &c. the seeds must be changed, and, as hath been repeatedly observed in various parts of my *System of Husbandry**, never be sown a second time in the soil that produced them. In the same manner, to have fine horses, &c. foreign stallions must be given to native mares, or foreign mares to native stallions: for otherwise, grains, flowers, animals, will degenerate, or rather imbibe so strong a tincture from the climate, that the mother will so powerfully influence the form, as to cause an apparent degeneracy: the form remains, but disfigured by many dissimilar lineaments.

* See in particular *Vol. I. p. 359, 424.*

Whereas, let the breed be mixed, and constantly renewed by foreign species, the form will advance towards perfection, and recruited nature display her choicest productions*.

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* Though it may not strictly belong to a work of this kind to discuss the general reason for these effects, yet I am persuaded the reader will not be displeased at seeing here the judicious M. de Buffon's conjectures on this head.

"Experience," says that learned Naturalist, "shews that animals, or vegetables, transported from a remote climate, often degenerate, and sometimes greatly improve in a small time; I mean, within a very few generations. That this is the effect of a difference of climate and aliment, is easy to conceive: and, in length of time, the influence of these two causes must render such animals exempt from, or susceptible of, certain affections and diseases. Their temperament must gradually alter; the formation, which partly depends on the aliment, and partly on the quality of the juices, must also undergo a change in the succession of a few generations. This change in the first generation is scarcely perceptible; as the two animals, the male and the female, which we suppose to be the progenitors of the species, had obtained their full shape and constitution before they were brought from their native country; and that however a new climate and food may change their temperament, these cannot act on the solid and organical parts, so as to alter their shape; especially if they had attained their full growth: consequently, in the first generation there will be no disadvantageous change; no degeneracy in the first production of these animals; the impression of the model will be exact. At the instant of their birth there will be no radical defect; but the young animal, during it's weak and tender state, will feel the influences of the climate. They will make different impressions on him, from what they did on his full-grown sire and dam. Those proceeding from the aliment will also be much greater, and act on the organical parts during the time of their growth, so as to vitiate a little of the organical form, and produce germs of imperfections, which will appear very sensibly in a second generation, when the parent, besides it's own defects, I mean those it derives from it's growth, has also the defects of the second generation, which will be then more strongly marked: and at the third generation, the defects of the second and third stock, caused by the influence of the climate and aliment, being again combined with those of the present influence on the growth, will become so pal-

The influences of the climate and aliment are remarkable, not only in the make of animals, but also in the colour of their coats: for, in the same climate, the wild and the tame are of the same,

pable, as to obliterate the marks of the original stock; so that these animals of foreign extraction, will have nothing foreign in them, but be exactly similar to the natives. Hence arises the necessity of crossing the breed of horses, and renewing it at every generation, by importing foreign stallions for the use of native mares. And it is very remarkable, that this manner of renewing the breed, which is only in part, and as it were, by halves, has a much better effect than if the renovation was total. A horse and a mare of Spain, for example, will not here produce such fine horses as a Spanish stallion with an English mare. This, however, will be easily comprehended, if we consider, that when a stallion and a mare of different countries are put together, the defects of both are compensated. Every climate, by it's own influences, and those of the food, imparts a certain conformation, which is faulty through some excess or defect. Thus, in a hot climate there will be an excess of fire, and in a cold one there will be the contrary defect: so that by joining animals of these opposite climates, the excess of the one supplies the defects of the other: and as that reaches nearest to perfection in nature, which has the fewest faults, and the most perfect forms being only such as have the fewest deformities, the produce of two animals whose defects are exactly balanced, will be the most perfect production of that kind. This equality is also the more accurately adjusted, the more distant the countries are, or rather the more opposite the climates natural to the two animals are to each other. The compound result is the more perfect, as the excesses or defects of the stallion's constitution are more opposite to the excesses and defects of the mare.

“ To give foreign horses to native mares will therefore always produce a certain advantage; whereas an increase of horses of the same breed in a stud, will always cause a certain loss, as they will, in a very little time, infallibly degenerate.

“ It may, perhaps, have been upon this very principle, and in consequence of long-since forgotten experience of the disadvantages resulting from alliances between persons of the same blood, that men, in general, first agreed to prohibit marriage between such as are very near of kin: for among all nations, even the least civilized, a brother was very rarely permitted to marry his sister. This custom, introduced among

same, or nearly the same colour; whereas those which live in different climates are of different colours. The effects of the climate and aliment being always the same, they produce in wild animals this uniformity; and the variety of colour in domestic animals is owing to the care of man, to shelter, to diversity of food, and to a mixture of foreign breeds. When the colour of the male is different from that of the female, the latter sometimes gives rise to beautiful peculiarities, as in pyed-horses, where the white and black are so strongly marked, and form such a glaring contrast, that it seems rather the performance of a whimsical painter, than the work of nature.

For the above reasons then, among many others which experience might furnish, the stallion and the mare should be suited to each other in colour and size, their shapes should be contrasted, and the breed should be crossed by an opposition of climates: but horses and mares foaled in the same stud should never be joined. It is by gradations that we must endeavour to arrive at natural beauty; for example, to give to a mare a little too clumsy, a horse well made and finely shaped; and to a small mare a horse a little higher; to a mare that is faulty in her fore-hand, an horse with

us by divine prohibition, but among other nations, founded on political views only, is, perhaps, owing to observation. Polity does not extend it's prescriptions in so general and absolute a manner, unless connected with nature: but if men once discovered from experience, that a desire of preserving a race, without mixture, in one and the same family, would produce a degeneracy, they would consider inter-marriages with foreign families as a law of nature: they would all agree in a prohibition of marriages among their own children. And, indeed, it may be presumed from analogy, that in most climates, men, like animals, would degenerate after a certain number of generations." *Hist. Naturelle du Cheval.*

a fine head, and noble chest, &c. But at the same time care should be taken not to make any evidently disproportionate copulations, as of a very small horse with a large mare, or a very large horse with a small mare; for the produce of such copulation would be small, or badly proportioned; and consequently that is not the way to correct the faults of the one by the perfections of the other. Some allowance should indeed be made for a mare that has never had a colt, because her first foal is never so strongly formed as the succeeding: for this reason it may be right to give her for the first birth, a larger stallion than it might be proper for her to have afterwards, in order that the defect of the growth may be compensated by the largeness of the size. These precautions are essential; but there are likewise other circumstances which should by no means be neglected; such as, that no short-docked mares be suffered in a stud, because from their not being able to keep off the flies, they are much more tormented by them than others which have a long sweeping tail; and their continual agitations from the stings of these insects occasion a diminution in the quantity of their milk, and has a great influence on the constitution and size of the colt, which will be vigorous in proportion as it's dam is a good nurse. Care should also be taken, that the stud-mares be such as have always been brought up in pastures, and never over-worked. Mares which have been brought up in the stable on dry food, and afterwards turned to grass, do not breed at first: some time is required to accustom them to this new aliment.

When the stallion is chosen, and all the mares intended for him are collected together, another stone-horse should be produced, in order to discover which of the mares are in heat, and, at the same time, contribute to inflame them. All the
mares

mares should be brought successively to this last stone-horse, which should also be inflamed, and suffered frequently to neigh. He will want to leap every one; but such as are not in heat will keep him off, whilst those which are so suffer him to approach them. But instead of being allowed to proceed so far as to satisfy his desire, he must be led away, and the real stallion be substituted in his stead. This trial is necessary in order to ascertain the true time of the mare's heat, especially of those which have not yet had a colt; for with regard to such as have recently foaled, the heat usually begins nine days after their delivery, and on that very day they may be led to the stallion to be covered; and nine days after, by the foregoing experiment, it may be known whether they are still in heat. If they are, they must, in this way of proceeding, be covered a second time, and so on successively every ninth day while their heat continues: for when they are impregnated, their heat abates, and in a few days ceases entirely. Not but that mares will admit of copulation after they are pregnant; though it never is attended with any superfætation.

Another, and most certain sign of a mare's being in heat, is her ejecting a viscid whitish liquor, called the heats, which likewise cease on conception. It is also known by the inflation of the lower part of the *vulva*, by her frequent neighings, and by her endeavouring to get to horses.

Before the stallion is brought to the mare, he should be well dressed, because that will greatly increase his ardour. The mare must also be curried, and have no shoes on her hind feet, some of them being ticklish, and apt to kick the stallion. A person holds the mare by a halter, and two others lead the stallion by long reins, till he is in
a proper

a proper situation, when another assistant carefully directs the yard, pulling aside the mare's tail; for a single hair might hurt him dangerously. After the mare has been covered, nothing more remains but to lead her away to the field. It sometimes happens that the stallion does not compleat the work of generation, but comes from the mare without making any injection. It should therefore be attentively observed, whether in the last moments of the copulation, the dock of the stallion's tail has a vibrating motion; for such a motion always accompanies the emission of the seminal lymph. If he has performed the act, he must not on any account be suffered to repeat it, but be led away directly to the stable, and there kept two days: for however able a good stallion may be to cover every day during the three months that mares are in heat, it is much better to let him be led to a mare only every other day, his produce will be the greater, and he himself less exhausted. During the first seven days, let four different mares be successively brought to him, and on the ninth day let the first be again brought, and so successively whilst they continue in heat; but as soon as the heat of any one is over, a fresh mare is to be put in her place, and covered in her turn every ninth day; and as several retain even at the first, second, or third time, it is computed that a stallion, by such management, may, during the three months, cover fifteen or eighteen mares, and beget ten or twelve colts.

Many, instead of bringing the stallion to the mare, turn him loose into the close, where all the mares are brought together, and there leave him to choose such as will stand to him. This is a very advantageous method for the mares: they will always take horse more certainly than in the other; but the stallion, in six weeks, will do himself

himself more damage than in several years by moderate exercise, conducted in the manner above-mentioned.

Though the usual season for the heat of mares be from the beginning of April to the end of June, yet it is not uncommon to find, amongst a large number, some which are in heat before that time; but it is adviseable to let this heat pass off without giving them a stallion, because they would foal in winter; and in that case, the colts, besides the inclemency of the season, would have bad milk for their nourishment. On the contrary, if the mares are not in heat till after the end of June, they should not be covered that season, because the colts which are foaled in summer have not time to acquire sufficient strength to resist the injuries of the following winter*.

When the mares are pregnant, and their belly begins to swell, they must be separated from those that are not so, lest these last should hurt them. They usually go eleven months and some days, and foal standing; whereas most other quadrupeds lie down. Those which cannot foal without difficulty, must be assisted; the foal must be placed in a proper situation; and sometimes, if dead, be drawn out with cords. The head of the foal usually presents itself first, as in all other animals†.

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* The Memoirs of the Royal Society of Agriculture at Rouen, published in 1767, seem here to differ from M. de Buffon. They say, that the best time for the stallion's covering of mares, is from the 15th or 20th of May to the 1st of August; because, as mares go eleven months, there is the more grass for them when they foal, they eat better, and have greater store of milk. *Tom. II. Mémoire sur les Haras de Normandie.*

† At it's coming out of the matrix, it breaks the secundines, or integuments that inclose it, which is accompanied with a great flux of the lymph contained in them; and at the same

The general custom of causing a mare to be covered so soon as the ninth day after she has foaled, is certainly wrong; because, in that case, having both her present and her future foal to nourish, her ability is divided, and she cannot supply both so largely as she might one only. It would therefore be better, in order to have excellent horses, to let the mares be covered only every other year: they would last the longer, and bring foals more certainly: for, in common studs, it is so far from being true, that all mares which have been covered bring colts every year, that it is looked upon as a fortunate circumstance if half, or at most two thirds of them, foal.

The foal should be separated from it's dam when it is five, six, or at farthest seven months old; experience having shewn, that such as are suffered to suck ten or eleven months, though usually larger and fuller of flesh, are not equal in other respects to those which are weaned sooner. The way to wean them, and to accustom them by degrees to a more solid nourishment than milk, is to give them bran twice a day, with a small quantity of hay; increasing this last as they advance in age. In this manner they should be kept in the stable as long as they express any desire of returning to their dam: but when this uneasiness is over, they should be turned into the fields; taking care, however, that they be not then fasting. An hour before they are turned to grass, the bran must be given them, and also

some time one or more solid lumps, formed by the sediment of the inspissated liquor of the *allantoides*. This lump, which the ancients called the *hippomenes* of the colt, is so far from being, as they imagined, a mass of flesh adhering to the head of the colt, that it is separated from it by a membrane called *amnios*. As soon as the colt is fallen, the mare licks it, but without touching the *hippomenes*; which points out an error of the ancients, who affirmed that she instantly devours it.

some

some water; nor should they be exposed either to severe cold or rain. In this manner they should pass their first winter. In the month of May following, they should not only be turned into the field every day, but may lie in the open air till the end of October, taking care that they do not feed on the rowings or after-math; for by accustoming themselves to this remarkably-delicate and succulent grass, they would contract a dislike to hay, which, together with barley and oats ground, is to be their principal food during the second winter. In this manner they are to be kept till their fourth year; spending the days only in the pastures during the winter, but both day and night in the summer. When they reach that age, they are taken from the pastures, and fed with dry meat: but one precaution at least necessary to be observed in this change of diet, is, to feed them only with straw during the first week, and to give them proper medicines against worms, which often trouble them, from bad digestions and too rank grass. Every one knows that the first foal of a mare, and indeed the first-born of every animal, never is so strong and vigorous, at least in it's youth, as the subsequent productions of the same mother.

Whilst the colts are weaning, they should be kept in a clean stable, but not over-warm, because too much heat would render them tender, and too sensible of the impressions of the air. They must frequently have fresh litter, and be rubbed often with straw; but they should not be tied or curried till they are three, or at least two years and a half old; because the roughness of this friction would give them pain; and their skin being too tender to endure it, instead of thriving, they would fall away. The rack and manger should not be too high, lest the necessity of lifting

up their heads to reach the food should accustom them to carry their heads in that manner, which would spoil their chests. When they are a year, or a year and a half old, the hair on their tails should be cut, because the succeeding growth will be stronger and thicker than the former: some cut it two or three times for this very reason. When they are two years old, they should be separated, the stone-colts to be kept with the horses, and the fillies with the mares; otherwise the former would fruitlessly weaken themselves with the latter.

At the age of three years, or three years and a half, they should be broke and rendered docile. To this end, a light easy saddle should be put on their back, and continued there two or three hours every day. They should also be used to receive the bit of a snaffle bridle into their mouths, and to suffer their feet to be taken up, and some strokes given on the soles, as if shoeing them. If they are designed for draught-horses, a harness should be put on their bodies, together with a snaffle bridle: but at first no bridle should be used. Afterwards, they should be trotted on the level ground, with a cavisson on the nose, but without a rider, the groom only holding the rein, and either the saddle or harness on their backs. When a horse intended for the saddle turns easily, and comes freely up to him who holds the rein, he should mount on his back, and immediately dismount, without riding him till he is four years old; as before that time his weight would be too much for him: but at four years old he may be ridden, and trotted at small intervals.

When a coach-horse is to be accustomed to the harness, he should be put into the carriage with a trained horse, and be led by a long rein till he begins to draw properly; then the coachman should

should begin to teach him to back, being assisted by a man who, standing directly before him, is to push him gently backward, and even give him a few stripes, that he may attain it the sooner, and with more ease. All this is to be done before the young horses have changed their food to oats and straw; for they grow more headstrong and difficult to break, in proportion as they increase in vigour.

The bit and the spur are two methods contrived for obliging horses to comply with their rider's intention; the former for rendering their motions exact, and the latter for increasing their swiftness. But as the proper management of both of these belongs to the riding-master, and neither to the husbandman nor to the bare breeder of horses, it of course does not appertain to the intention of this work, and I therefore cannot do better than refer the curious in these matters to M. de la Gueriniere's *Eléments de la Cavallerie*, and Mr. Berenger's lately published excellent work on horsemanship.

I cannot, however, dismiss this subject without adding the following methods of taming a wild horse, and a wild colt; the former from the author of the *Lives of the Buccaneers*, and the latter from M. de Garfaut.

Wild horses are very numerous in several parts of North America, and still more so in the island of Domingo in particular, where troops of above five hundred of them have often been seen together. They are taken in toils laid for them in places where they frequent, and are easily entangled; but if it happens to be by the neck, they strangle themselves, unless some person is ready at hand to assist them. When taken, they are fastened round the body and legs to trees, and there left two days without either meat or drink.

drink. This renders them tame, and in time they become as tractable as if they had never been wild.

M. de Garfaut's method is thus. "Colts," says he*, "which have not been broke whilst very young, are often so fearful of the approach and touch of a man, that they bite and kick in such a manner as renders it almost impossible to bleed or shoe them. But if they are not to be managed by patience and mildness, recourse must be had to the method used in falconry, for taming a bird newly taken, and intended to be fitted for flight; and this is, by not suffering him to sleep till he falls down with weakness. So likewise a wild horse must be fastened with his hind parts to the manger, and a man stand day and night at his head, to give him from time to time a handful of hay, and hinder him from lying down. It is surprizing to see how soon the generality of horses will be tamed by this method; though the obstinacy of some is such, that they must be watched in this manner for a week or more."

Mares usually breed till they are fourteen or fifteen years old; and the most vigorous, till they are above eighteen. Stallions, when they are well managed, will engender till the age of twenty, and even longer: but it is to be observed, that those horses which are soonest made stallions, are also the soonest incapable of generating: thus the large horses which acquire strength sooner than the slender, and are therefore often used as stallions as soon as they are four years old, become incapable of generating before they are sixteen.

The horse sleeps much less than man. When in health, he seldom lies down above two or three hours at a time, rising up afterwards to feed; and when he has been over-worked, he lies down a second time, after feeding; but in the whole

* *Nouveau parfait Marechal.*

twenty-four hours, he seldom sleeps above three or four. Some horses never lie down at all, but always sleep standing; and those which do lie down, sometimes also sleep resting on their hind legs. It has been observed, that geldings sleep oftener and longer than stone-horses.

All horses, like most other hairy animals, shed their coats once a year; generally in the spring, but sometimes in autumn: They are then weaker than at other times, and should therefore be more tenderly used, have some small addition made to their food, and be more regularly looked after. Some horses also shed their hoofs: a misfortune which too frequently attend those that have been brought up in marshy countries.

The duration of the life of horses is, as in every other species of animals, proportioned to the term of their growth. Man, who is fourteen years in growing, may live six or seven times that space; that is, ninety or an hundred years. The horse, whose growth is ended in four years, may live six or seven times as long; that is, twenty-five or thirty years: and the instances which might be produced in opposition to this rule are so rare, that they cannot be considered as an exception from whence any consequences might be drawn*: for if large horses are full grown sooner than those that are slender, their lives are accordingly shorter, and they become old at fifteen.

The horse, after spending his life in the service of man, is still useful to him after death, though not in so great a degree as some other creatures.

* What Pliny says of the horse that, after quitting the circus, served as a stallion to thirty-three, and was then dismissed; and Dr. Plot's finding in Oxfordshire three horses of forty years old, or upwards; can be looked upon only as extraordinary instances of longevity, and as such it plainly is that both the above authors mention them.

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Of the hair of the mane and tail are made bottoms of sieves, seats for chairs, settees, &c. waistcoats, womens hats, hair-cloths, hair-lines, and a variety of other things in the weaving and upholstery businesses. Musical instrument-makers employ it in the bows for fiddles: in the toy-shops we meet with it in comb-brushes and many other things, and, after being prepared, it comes into the hands of the peruke-makers. It is likewise made into fishing-lines, springes, snares, &c. The other hair, when taken from the skin, is mixed with that of cows, and used for the same purposes. The skin itself is tanned and dressed, chiefly for the use of saddlers. Spectacle-rings and other trifles of that kind are sometimes made out of the hoofs; and in France the enamellers use an oil made from the fat of horses which affords a clear strong light with very little smoke.

CHAP.

C H A P. III.

OF THE DISEASES OF HORSES.

P A R T I.

Of the internal Diseases of Horses.

I N T R O D U C T I O N :

Containing some general Rules for preserving the Health of Horses.

IT is better to preserve the health of cattle by diligence and care, than to rely on the use of medicines; and as it is said that the master's eye makes the horse fat, so no less true is it that his inspection will keep the horse in health.

Let it be made a general rule, to give horses as few medicines as possible; and on no account to imitate the absurd practice of those who are perpetually bleeding, purging, and forcing down balls, though their horses are perfectly well, and shew not the least symptom that requires such treatment. Proper management in their feeding, exercise, and dressing, will alone cure many disorders, and prevent most; for, as Mr. Bartlet justly observes, * The simplicity of a horse's diet, which chiefly consists of grain and herbage, when good in kind, and dispensed with judgment, secures him from those complicated disorders, which are the effect of intemperance in the human body.

Care should be taken that the pavement of the stable be raised highest where the horses stand,

* *Gentleman's Farriery*, p. 1.

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and that their urine be carried off readily, so that it may not remain and hurt their feet, by softening them. The Romans * preferred hard solid oak to any other substance, for their horses to stand on, particularly as best calculated to harden their hoofs. The manger should be kept free from all kind of filth, lest it hurt the horses; and it should be divided into separate partitions, that so each horse may be secured in his share of corn; for there are some which swallow it much faster than others: and the situation of the rack should be suited to the stature of the horse, neither too high, lest the throat be hurt by extending it too much, nor too low, lest the hay or other food should fall into his eyes and injure them. A considerable quantity of light should be admitted into the stable, lest by the horse's being accustomed to darkness his eye-sight should be impaired when he is brought out into open day; and it should be rather cool than hot in the winter, because the sudden change from thence into an unusual cold will hurt the horse. If the weather is very severe, his body may be cloathed. In summer, the stable should be well aired by night as well as by day.

The food of horses should be sweet and free from all impurities, especially the dung and feathers of fowls: hay is so essential an article in their diet, that no pains should be spared to procure the best; and when it is not extraordinary, the dust should be well shook out before it is put into the rack; for such hay is very apt to breed vermin. The allowance of hay should be proportioned to the constitution of the horse, and a lean horse should have more than a fat one: but too much is hurtful, especially to fine horses.

* *Vegetius, Lib. I. c. lvi.*

Their oats should be well sifted, and cleared of dust; and particular should be taken that they be neither musty nor smell of rats; for these are very disgusting to horses. Well ripened oats are a more hearty and durable food than barley, and better suited to the constitutions of English horses; as has been proved by experience; and a proper quantity of cut straw and hay mixed with them, is sometimes very beneficial to horses troubled with worms, indigestion, &c.

Beans afford the strongest nourishment of all grain, but are, in general, fittest for hard-labouring horses. In some seasons they breed a kind of vermin called the red-bug, which is thought to be dangerous. The best method of using them, is dried and split, then mixed with bran, and given to the horse before his oats.

The bran will keep his body open, and the beans prevent its scouring, which horses of weak bowels are subject to, especially on a journey. Too frequent a use of bran alone, either dry or scalded, is bad, because it relaxes too much. However, it should always be sweet and new.

The method which some practise of giving to young horses oats, or pease, &c. in the straw, is attended with, at least, this inconvenience, that by pulling out the straw, in order to find the corn, they contract a bad habit, which they never after forget, of pulling most of their hay out of the rack into the manger, or on the floor, with the same expectation.

Most of the disorders of horses proceed from their drinking bad water; such as is too sharp, too raw, chilling, or marshy water. Clear river water is the best; and accordingly, where it is near enough, the best way is to take the horse to the river to drink in the summer, but as seldom as possible in the winter, if there be a well

at home; because water fresh-drawn from a well in the winter is warm, and consequently good for horses. If there be a necessity for using well-water in summer for the drink of horses, it should be drawn a long time before it is given them, and exposed to the sun in tubs, or clean stone troughs, to correct the too great crudity of the water, which would be very hurtful to them. Pond-water is good for them, but all marshy waters are full of bad qualities, and therefore should be avoided.

A gentleman in Suffex, with reason highly esteemed for the great military services he has done his country, as well as for his judicious improvements in agriculture, has, in his stables there, a stone basin fixed in the wall before every horse, with water in it, of which the horse sips as his mouth becomes dry; and another similar basin for his corn and cut straw, instead of a manger.

Horses should have their quantity of corn portioned out to them at different times, because when they receive it by little and little, they chew and digest it better; whereas, when they eat too greedily, it is swallowed without chewing, and thereby voided entire and undigested, with their dung. To prevent this, and to oblige them to chew it the more perfectly; many add to it chopt straw, I would here recommend the use of the rollers mentioned in vol. v. p. 128, of my System of Husbandry, because the mealy part of the corn which has been passed through them will be so thoroughly bruised, that it will dissolve entirely in the stomach; and, as was observed in the place here referred to, a less quantity thus bruised will be as nourishing as the more plentiful usual allowance.

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The vast improvements lately made in husbandry have afforded a great variety of wholesome food for horses, which our forefathers were not acquainted with. In the winter, we now have not only hay of the best qualities, but also succulent plants which horses are fond of, and which are found to agree perfectly with them. Such are particularly carrots, potatoes, cabbage, turnips. These render the salt marshes much less necessary than when horses have lived long upon dry food; though they still are beneficial, especially after horses have been hurt by long-continued, or hard labour. Where salt marshes are not at hand, sea-salt should be mixed with the food of horses, for it has been found highly beneficial in many countries.

All kinds of cattle are observed to be fonder of salt, the farther they are distant from the sea. Thus, in America, horses which are bred up near the sea shew no extraordinary liking to salt whilst they remain near that element; but after being carried to a distance from it, they become fonder of salt than of corn. The case is the same in Switzerland, and doubtless in other mountainous countries. Is it, that there arises from the sea an exhalation so impregnated with saline particles as to render the use of salt there less necessary for cattle? In some parts of America there are spots naturally abounding in salt, to which even the wild creatures there resort at certain seasons, and lick up the earth with which it is mixed; whence those places are called salt-licks.

To those who have not a sufficiency of the above-mentioned succulent plants, the improved husbandry offers lucerne, which rises early in the spring, and affords both food and physick:

for, as Columella observes *, it is a remedy for sick cattle, and emaciated cattle grow fat with it. What is more, it continues during the whole summer so nourishing a food, that horses can go through all their usual labours without any corn, when fed with this plant†. However, though it is so well suited to soil and feed horses, yet fields of grass in which they may go at large, are also necessary, and especially when their limbs have been any way diseased.

A summer's grass is likewise often necessary to horses that have been glutted with food, and not sufficiently exercised; and indeed, where it can be done with convenience, a month or two's running is proper for most horses. May and June are in general the best time for this, because the juices of vegetables are then in their highest perfection, the heat of the weather is not so overpowering as in July and August, and the flies, those unmerciful plagues to all cattle, are far less troublesome. Some even think that most horses would be the better for being kept abroad all the year, where they have a proper stable, or shed, to shelter them from the weather, and hay at all times to go to. Thus treated, say they, they are seldom sick, their limbs are always clean and dry, and, with the allowance of corn, they will do more business than horses kept constantly at home. At the same time it is to be observed, that the grass of high-dunged fields, such as those near great towns are apt to be, is reckoned very injurious to horses, especially if they feed thereon all the summer.

If horses grow hot and costive upon their being taken up from grass, it will be right to mix

* *Lib. II. c. xii*

† For proofs of this, see *Mills's System of Husbandry*, vol. III, p. 266, 271.

bran and chopt straw with their corn, and to give them now and then, for a fortnight, or longer, a feed of scalded bran. Their exercise and diet should be moderate for some time, and both be encreased by degrees.

When horses are *soiled* in the stable, care should be taken that the herbage, of whatever kind it be, whether grass, green barley, tares, clover, or any other proper vegetable that the season affords, be young, tender, and full of sap, and that it be cut fresh once every day at least, if not oftener; for when plants are grown old and fibrous, they have lost their fine sap, have a tendency to putrefaction, and frequently cause obstructions in the bowels; which are sometimes attended with bad consequences, unless an evacuation is procured; a proof of which is, that the excrement evacuated when the body is in that condition often appears like dung that has laid long to rot on a dunghill.

When horses lose their flesh much in soiling, they should be taken up in time, and returned to a more solid diet; for it is not in soiling as in grazing, in which last, though a horse loses his flesh at first, yet after the grass has purged him, he soon grows fat.

The only general rule that can be given for the feeding of horses is, that all horses which work hard and constantly, should be fed well and plentifully: others should be fed in proportion to their exercise, and not kept to certain regular stated feeds, whether they work or not.

Good feeding is not alone sufficient for horses; they must also be well dressed, that is to say, curried every day, to keep their skin free from filth and impurities, which might otherwise breed the mange, and occasion numbers of inconveniencies that would make them fall away visibly: besides,
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the motion of the curry-comb helps perspiration; and it is a known fact, that a horse well dressed, curried, dusted, and rubbed down, will preserve his good appearance, and grow fat, with less food than one that is not taken equal care of in those respects, though allowed a larger quantity to eat. The horse's head should be rubbed hard with a strong brush, and particular care should be taken to clean his eyes and eye-brows with a rubber, which generally is a piece of serge, as also his ears, channel, and other parts where the curry-comb could not be used. The brush is then passed all over the body, to lay the hair smooth, clearing it and the curry-comb alternately one with the other during the whole of this operation. To complete the business, after the horse has been dusted he should be rubbed heartily every way with a good thick wisp of straw soaked in water, all over his body, and most especially about the legs and joints, where it is proper to dwell longest: this rubbing opens the pores, dispels the humours, enlivens and strengthens the horse. The mane and tail should then be combed, but gently, beginning at the bottom and proceeding gradually towards the roots, not to tear off the hair. The horse should afterwards be taken to drink, cheering and enlivening him all the way. It is, however, to be observed, that all this trouble is not absolutely requisite every day for common draught-horses in the country: they would indeed do better with it; but as the husbandman cannot well afford so much time to be bestowed upon them, I would only recommend the doing of it as often as can conveniently be.

The Romans, who were much accustomed to rubbing their own bodies, were particularly careful that their horses should be curried twice a day,

day, and, as Columella observes*, found it of more benefit to them, than a large allowance of corn; and besides, the frequent handling them renders them tame and gentle. Not contented with rubbing, they also had † near the stable, either a lawn, or a place covered with soft straw, where the horses might tumble or roll themselves, which exercise is beneficial to their health; as their neglecting or avoiding so to do indicates the beginning of some indisposition.

Frequent and moderate exercise conduces much to the horse's health; but, in riding, especial care should be taken that the person who mounts him do not hurt his gait by being too impatient, nor with whip and spur wantonly force him to a full gallop, as is too often done: neither should he be on any strong exercise whilst his belly is full of meat or water. The Roman writers all agree, that when a horse is jaded, or has been over-worked, a mixture of wine and oil should be poured down his throat, or, at least, his mouth be rinsed with it: and if by preventing their pissing in due season, a stoppage ensues, they order their loins to be well rubbed with the same mixture. Every one knows, that a horse should not be suffered to cool too fast after he has been heated by violent exercise, and that his drinking cold water then will generally gripe him, and always endanger his wind.

After a journey, or other exercise, great care should be taken that the horse's feet be well washed and examined, in order that no hard substance may be left adhering to them. The heat should also be taken off by the use of some cooling ointment, or pultice.

* *Lib. VI. c. xxx.*

† *Vegetius, lib. I. c. lvi.*

It is of essential importance for the health of horses, that their stables be kept clean, and their litter renewed as often as can be; for the dung that is left there to rot becomes so hot, and the urine and other impurities that remain become so acid, that the feet of the horses are heated and spoiled in a short time. From thence proceed most of the disorders in the feet which often render them incapable of service, without either the master or servants knowing the true cause. Besides this, fresh litter never fails to make the horse stale, when he returns from work and finds it in the stable, which he would not do if there was only old litter; and his retaining his urine when heated by hard labour would frequently bring on inflammations, obstructions in the neck of the bladder, or in the urinary passage, and several other distempers, of which horses often die, if not speedily remedied.

A horse should not be worked hard while he is shedding his coat, as generally is the case in spring; and he should also then be fed better than usual. Some shed their coats in autumn; and others again, especially the Dutch horses, sometimes cast their hoofs.

We are apt to be too busy in endeavouring to correct the works of nature. Upon this principle is founded the too common practice of cutting off all the hair from the joints and neck of a horse, where it really is an ornament when kept clean and in order, and undoubtedly useful. The groom gladly clips the heels, to save himself trouble in washing them; but of all the absurdities that man ever dreamt of, none surely can be more ridiculous, certainly none can be more irrational, than the barbarous custom of *docking*, as it is called. What could possibly possess any one to think of robbing
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this fine, this noble creature, of so very necessary a defence against flies and other insects, and at the same time so great an addition to its beauty! Our gentry of the army are now become so sensible of the disadvantages a horse labours under from the loss of his tail, especially when tied to the stake in a camp, that it is said, all their young horses are to have their tails.

Nicking is equally absurd, and as little necessary.

S E C T. I.

Of Bleeding, Purging, and Glysters.

BY premising here some general observations concerning these matters, there will be the less need of repetition when they come to be directed in particular distempers.

It was an early custom to bleed horses and other cattle at certain stated periods, especially in the spring; and from the frequent repetition of this practice arose a necessity of continuing it, because the want of an habitual evacuation occasioned diseases, as we find in the human species: but the more prudent among the antients condemned it. An opening and cooling diet may answer all the ends of bleeding, and frequently to better purpose, without making so great a change in the quantity of the animal juices.

When a horse is to be bled, the operator cannot do better than observe Vegetius's following judicious directions*. Gird the horse's neck with a leather thong, or a cord, so that the vein may

* *Vegetius Renatus, de Morbis Equorum, &c. Lib. I. c. xxii.*

be seen distinctly; then wash the vein with a sponge dipped in water, that it may stand out the higher; press upon the vein with the thumb of the left hand, above the place in which the incision is to be made, that so the vein may be more tumid, and less apt to escape under the fleam, which is then struck into it: or, instead of a fleam, a lancet may be used, resting the hand on the middle finger, that the lancet may not pierce too deep. Having struck the vein, give the animal some food to eat, in order that, by the motion of the jaw-bones, the blood may break out with the greater force. The blood at first is dark coloured, and so soon as it appears of a livelier red, the vein should be closed; few authors mentioning the precise quantity that should be taken away. Mr. Bartlet * advises rightly to bleed horses by measure, from two to three quarts being in general a sufficient quantity.

The Romans, who were very fond of rubbing the bodies of animals, ordered the blood to be mixed with vinegar, and the whole body to be then anointed therewith; or especially the part where any particular complaint obtained: in a few days after, the animal was washed in the sea, if near, or otherwise in common water.

Before the circulation of the blood was known, bleeding used to be ordered in different parts of the body, according to the situation of the complaint; it being then held essential that the blood should be taken as near the part affected as possible: but now that it is known that bleeding in any part lessens the quantity equally, the neck is generally preferred, as yielding a fairer vein. However, it may still be of use to bleed near the affected part, if there is a fair vein.

* *Gentleman's Farriery*, p. 11.

Many are afraid to purge their horses, on account of the inconveniencies which have frequently been observed to arise from this operation. Here M. Bourgelat, Inspector General of the Veterinarian School at Lions, judiciously asks *, Whether the precautions indispensably necessary in the administration of purges have been observed? Has blood been taken away when needful; have mild and softening drinks been given; have the hard excrements been discharged by means of glysters, and has the action of the medicine been by this means directed to operate this way? Has care been taken that the stomach was not loaded with food, neglecting the precaution of keeping the animal fasting for six or eight hours before and after taking the purge? Have not strong purges been preferred to mild ones in disorders of the lungs, and where nature endeavoured to throw the sharp humours upon the skin? Have cooling purges been preferred in feverish disorders? Have the purges been adapted to the various purposes for which they were intended? In short, did not the animals labour under disorders which were in themselves incurable?

Now that we have mild purges which may be adapted to different cases, let us not be deprived of the only means of clearing the bowels: for after repeated trials on horses, mules, and sheep, it appears that these creatures cannot vomit; nor indeed does the structure of their stomachs admit of it.

When the intention is to cool and bring about the discharge of sharp humours, M. Bourgelat proposes the following forms. From four

* *Matière Médicale raisonnée, à l'usage de l'Ecole Royale Vétérinaire, p. 50.*

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ounces to half a pound of Epsom salt, or Glauber salt, or the bitter cathartic salt, may be dissolved in a quart of water and given in the morning. Or two ounces of fenna, with an ounce of any of the above salts, may be boiled in three pints of water for half an hour, and the strained liquor given in the morning.

When the intention is to stimulate to a greater degree, more powerful purgatives may be given; and as they do not readily mix with water, it is most convenient to make them into balls. Jalap in powder may be given, to an ounce and a half; Scammony, to half an ounce; Aloes, to an ounce and a half, or two ounces. The medicines act much more mildly, if they are well rubbed in a marble mortar with some salt, such as cream of tartar, or nitre, till reduced to a fine powder; and they also dissolve more readily in the bowels. These may be made into balls, with honey, or any syrup. More costly gums are much harder of digestion, and perhaps not of an efficacy answerable to the expence: but if they are thought necessary, they may be added to the above, in the quantity of two or three drams. The chemical oils which used formerly to be added to balls, are in themselves very heating, and by no means answer the intention of lessening the griping. For this reason, physicians have now laid them aside in their prescriptions for man; as I think they should likewise be for other animals.

The operation of a purge is much slower in horses than in men; for it is from fifteen to twenty-four hours before it begins to work in the former; probably owing to the great length of their intestines: and if they do not purge at all, no bad effect need be feared from them, because they then pass off by urine, or become alteratives.

teratives. Their operation is also more or less slow, according to the quality of the food of the cattle, whether green or dry; for in the first case, very mild medicines operate, especially in horses which are easily purged. Some may be purged with a pound of honey in a draught of bran and water, and this has very good effects in coughs, a loss of flesh from too hard labour, &c. when the medicine is continued for some days; intermitting it as occasion may require. Purges given in a liquid form work more speedily than in a more solid state.

The cases in which purging is necessary, will be pointed out when we come to speak of particular diseases: therefore we shall only mention here, as a general rule, that a purging medicine should be given in the morning, before the animal has broken his fast, and that he should be kept from solid food for some hours after; though, in the mean time, it will be proper to give him warm mashes. If he refuses to take warm drinks freely, let him have them cold; for it is absolutely necessary that he should drink plentifully. A little hay may be given at times; and walking him about gently, will forward his purging.

As was before observed of bleeding, so in physicking, many people think it is necessary to purge their horses at stated times, and here again, by so doing, they at last render it necessary: but on due reflection it will appear, that good health wants no mending, and that he who purges either himself or his horse without sufficient cause, rather impairs than betters the constitution. They have a favourite season too for purging, which is the spring; the very time when it is, of all others, the least necessary: for nature then affords the best physic that can

be given. Every succulent plant that grows contains a juice, not only purgative, but also highly salutary in it's saponaceous and deobstruent quality. Boerhaave, in order to enforce the practice of soiling cattle early in the spring, mentions an observation made by butchers, purporting, that though they seldom kill stall-fed cattle which have not concretions in the gall-bladder, yet such are never found in those that have been fed on grass whilst growing.—If there was no other advantage arising from the use of lucern, than the early opportunity it affords of soiling horses, as well as other cattle, it would be well worth the husbandman's while to cultivate it. In so high esteem was it held by the antients on this very account, that the Romans gave it the name of *medica*, for its great medicinal virtues.

Purges should at first be given in moderate doses, lest they prove ~~too strong~~ for some horses, and purge them too much. This, indeed, generally proceeds from the purging substances being of too stimulating and acrid a nature, whence they force off the mucus which naturally lines the intestinal canals, and thereby occasion most severe griping. In this case, mild substances, such as may line the intestines, are proper; and of this nature are all mealy mashes, especially if boiled up with gum Arabic, or the gums which distill from our own fruit-trees. Sometimes a purge may bring into the intestines an acrid matter, which, by its irritation, continues the purging. When this happens, it must be discharged; and for this purpose the cooling salts answer best: from a gill to half a pint of oil may be mixed with the solution of the salt, because, by adhering to the intestines it supplies the place of the abraded mucus. Warm stomachic liquors,
such

such as the bitter decoction of the shops, may also be given. Diascordium, to the quantity of an ounce, being dissolved in the decoction, adds to its efficacy; and opium may take off the irritation, when given to the quantity of an hundred drops of the tincture. Agreeable to the above, Mr. Osmer (a) orders gruel made of rice, and gum arabic dissolved in it, with Philonium Romanum at proper intervals.

As the purges in a liquid form must be given with a horn, it cannot be improper here to caution the unskilled against the too-general want of due care in the use of that instrument. The creature is often held too long in the uneasy situation which it is necessary then to put him in, and that no part of the liquor may be lost, it is poured down his throat with so long-continued a stream, that he is in danger of being suffocated. These inconveniencies might easily be prevented, by having a cover to the horn, and a valve which may be opened or shut by means of a spring near the small end; for thus no part will be lost, and the stream may be interrupted so as to give the animal opportunities of drawing his breath at times.

Glysters are also given to horses with great success: but previous to their being administered, the hard excrements lodged in the great gut should be taken out, by introducing the hand well anointed with oil. This not only makes room for the glyster, but, when a purge is given, removes those impediments, which otherwise, through the largeness of that gut, form a considerable resistance to the evacuation of the contents of the higher intestines, and thereby often bring on those severe colics and distension of the

(a) *Treatise on the Diseases and Lameness of Horses*, p. 163.

belly, which are sometimes the consequences of purges. The glysters not only contribute greatly to the removal of this obstruction, but also, when they are of a stimulating nature, by co-operating with the purge, render it much easier, speedier, and more effectual.

I join in opinion with Mr. Bartlet (*b*), that a bag and pipe of a proper form is preferable to a syringe, with which last it is impossible for the operator to accommodate himself to the horse's motions, because of the length of the syringe; nor has he so much at command the force with which the glyster should be thrown up: for, as that gentleman observes, if it is thrown up with much force, it often surprizes the horse, and makes him reject it as fast as it goes in; whereas the operator having the bag entirely at command, can press the liquor up gently, or with what degree of force he finds necessary.

I shall hereafter have occasion to point out cases in which glysters are necessary; and shall then mention their proper compositions according to the end for which they are intended.

S E C T. II.

Of a Cold.

IN other animals, as in man, the trachea arteria, or wind-pipe, and all its branches, are moistened with a fluid which accompanies the breath in expiration. This fluid may acquire a degree of acrimony, which, by the irritation it occasions, creates a Cough, or an endeavour of nature to throw it off with the air in expiration.

(*b*) Page 22.

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This acrid defluxion is generally communicated to the membrane which lines the nose, palate, and eyes, and is then called a Cold. The disease continuing for some days, this humour becomes thicker, so as sometimes to assume a purulent appearance. If the disease is neglected at first, the glands which separate this fluid become diseased, and the lungs are from that time loaded with a tough glutinous matter, such as we see thrown up in coughing. This disease is always attended with some degree of fever, sometimes to a very considerable height. If it is accompanied with an inflammation of the lungs or pleura, a suppuration, and consequent pthysis or consumption, follows. The utmost diligence should therefore be exerted in endeavours to cure so dangerous an evil.

The signs of it are as follow: the eyes become heavy, and sometimes watery; the nose runs; the horse rattles in his breathing, and coughs; the glands in the mouth and under-jaws sometimes swell. If the fever is considerable, the flanks will work, and he will loath his meat; and if the glands about the palate swell, he will refuse his water, because deglutition is then attended with pain: his mouth too will appear slimy and foul. If he coughs freely and strong, is but little off his stomach, dungs and stales readily, and if his skin and coat feel kindly, the danger is not great.

This disorder is generally occasioned by some alteration in the horse's manner of life, such as his being suffered to stand in a cold place after having been heated with strong exercise, his drinking too much cold water when over-hot, his standing in a colder stable than usual, or a neglect of due care in the management of him.

Vegetius (*a*) observes, that a horse thus diseased frequently hangs his head down to the very ground, and, when he drinks, the water runs through his nostrils; to remedy which, he directs that a gagg be put into the horse's mouth, and that the hand of a man be then thrust into it flat, in order to break with the nail a little blister, which will be found in it's upper part. He also remarks, that whatever irritates or injures the jaws or throat, such as a beard of corn, a bit of bone, dust, or stone, or any other substance that may stick in the throat, will occasion a violent cough, and that unless speedy relief be given, the intolerable pain thereby occasioned may make the horse run mad. In this case it is necessary to examine the mouth carefully in the sun, that such things may be the more easily discerned and pulled out; after which the part should be washed with warm water wherein nitre hath been dissolved. Likewise, in another place (*b*), he speaks of an almost incurable cough which arises from ailments in more internal parts, and is known thus: stop the horse's nostrils so that he cannot breathe, and then observe his flanks; if they beat very fast, the cough proceeds from a disorder in his bowels; and if they beat slowly, it arises from a tension or straining of the parts, which have been hurt by hard riding, or leaping over too broad a place. Wounds also, from any cause, may, after they are healed, by the cicatrice's contracting into a narrower compass, leave a roughness, which, by the irritation it gives, occasions a continual cough.

On the attack of a cold, it will in general be advisable to bleed the horse; and if the cold is

(*a*) *Lib. III. c. lxi.*

(*b*) *Lib. III. c. lxx.*

attended with any degree of fever, the bleeding should be repeated. After the first bleeding, it will be proper to procure loose stools, at first by means of a stimulating glyster. To this end, make a decoction of a large handful of mallow leaves and of chamomile flowers in a gallon of water, so that there may be about three quarts of the strained liquor: add to this four ounces of any purging salt, and half a pint of oil. Or, if such a decoction is not easily come at, milk, whey, or thin broth of any kind, may be given with some sea-salt and oil. This, with mashes in which honey and nitre have been dissolved, will keep the body open.

M. Bourgelat (c) judiciously distinguishes the medicines proper for a cough into two kinds, namely, the mild cooling kind, and the stimulating, whose effects being different, they are given in different periods of the disease. He observes, that it is not so easy to judge of the state of the disease in horses, as in men, in which last the colour and consistence of what is coughed up affords a means of judging; whereas in horses, the cough brings the matter discharged from the wind-pipe only into the back part of the mouth, from whence it probably slips down into the stomach; unless it is brought up in such quantity as to flow out by the nose: and then very properly adds, “ we may easily judge what skill
“ is requisite to use judiciously arms which are
“ so different in their effects; what inconveni-
“ encies might arise on one hand, if the stimu-
“ lating were administered whilst an acrid thin
“ fluid is discharged; and on the other, after
“ this humour has, by a due concoction, been
“ brought to a kind of matured purulent state,

(c) *L'Ecole Veterinaire*, p. 82.

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“ how great the danger that the lungs might be
 “ too much weakened by a continuation of the
 “ cooling relaxing medicines before so neces-
 “ sary.”

It is most adviseable after evacuations to begin with mashes and drinks, made of the mild and cooling substances, such as the roots of liquorice, marsh mallows, the leaves of common mallow, linseed, bran, the mealy substances, or sliced figs. This decoction should be sweetened with honey, and to it may be added sweet oil, first mixed with honey. A quart, or three pints, of this drink may be given three or four times a day, with a horn; and either in the decoction, or with the horse's other food: it will be right likewise to give about four ounces of nitre in the course of the day. Mr. Osmer (*d*) directs for this purpose, two ounces of cold-drawn linseed oil, one ounce of salt-petre, two drams of volatile salt of hartshorn, to be mixed together, and given daily in some linseed tea, barley-water, or any such vehicle.

This cooling regimen is much safer than the warm drenches generally given by farriers: and even if it should be continued so long as to bring the horse very low, it is much easier to give a spur to nature when the creature seems languid, than it is to repress the disorders which arise from too much heat, or too quick a circulation of the blood. Nitre is here of singular advantage as a cooler, as it causes a secretion by urine, which may carry off a great deal of the humour that might otherwise fall on the lungs.

If the cough still continues, though the fever and other complaints abate, then pectorals of a

(*d*) Page 255.

stimulating

stimulating nature may be given. Such are elicampane, hyssop, garlic, squills, gum ammoniac, &c. which may be made into balls, with honey, of an oblong shape, and never so large as to be difficult to swallow. Columella (e) recommends four ounces of the juice of leeks, with as much oil; in which he is seconded by Vegetius (f), who generally mixes wine with his drenches, by way of cordial. This last also says (g), that an obstinate cough may be cured with half a pint of wine, three ounces of oil, and a raw egg, given with a horn for three days. He likewise recommends the (h) following as a cheap drench: Take powder of beans, fenugreek, and elicampane, of each six ounces, of comfrey three ounces, and of butter six ounces; beat them together with three pints of good wine, and a pint and a half of water, and give the horse two hornfuls of it fasting, till he has drank up the whole. As in most other disorders, so in this, he advises that the back, loins, chest, neck, and jaws, be rubbed with wine, oil, and salt. He also adds opium to his balls, which is found to be of great efficacy where the cough arises from some irritating cause, and is likewise farther beneficial, in that, by the calm it gives, it helps to restore a more equal circulation of the juices, and thereby to promote the perspiration, which in a cold is generally interrupted.

The authors of the *Maison Rustique* (i) recommend the following powder, as a cure for either old or newly-contracted coughs. "Take
" roots of elicampane, or marsh mallow, gentian,
" and galanga, of each eight ounces, stick-liquor-

(e) *Lib. VI. c. xxxi.*
(g) *Lib. V. c. ix.*

(h) *Ibid.*

(f) *Lib. III. c. lviii.*
(i) *Tom. I. p. 258.*

" ice

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“ice a pound, and as much leaves of tamarisk;
 “moth mullein, and carduus benedictus, of each
 “four ounces, fenugreek six ounces, and as much
 “flour of sulphur; Spanish aniseed, and cinnamon,
 “of each two ounces; dry the whole in the shade,
 “and pound it to about the bigness of coarse
 “rappee-snuff; mix the whole well together, and
 “keep it in a dry place, in a bottle closely stopped.
 “The dose is a good table-spoonful, mixed with
 “moistened bran or oats, and it is to be given for
 “several days running. If the horse dislikes it at
 “first, the quantity may be lessened then; but after
 “he is once accustomed to it, he will grow very
 “fond of it.—The use of this powder does not pre-
 “vent a horse’s working: on the contrary, it will
 “have the greater effect for his so doing.—This
 “powder is likewise excellent to cool the flanks of
 “horses that are over-heated, and in the begin-
 “ning of a purfiness. It fattens the leanest, and
 “kills their worms.”

Some have thought, and perhaps not without
 reason, that the cough which attends a cold is in-
 fectious. Whether it be absolutely so, or not,
 the wisest course certainly is to err on the safest
 side; and on that account to remove every horse
 into a stable, or pasture, separate from those that
 are affected with this disease, or indeed with any
 other internal disorder. If put into a stable, it
 should be well aired, and the manger and stand
 made very clean. The warm steam that arises
 from his mashers undoubtedly loosens the matter
 which flows from the nose, and has probably the
 same effect on the lungs; to the great present re-
 lief of the horse, and hastening of his cure. What
 food he now eats should be given in small quantity
 at a time, that it may not be tainted by his breath,
 which is loaded with some of the morbid matter.

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In all modern writers, some chemical oils are favourite remedies ; but if we attend to their heat, and how difficultly they are assimilated with the other fluids, I hope that the Husbandman, for whom this work is principally intended, will believe my omission of them really meant for the benefit of his horses. Indeed, I have all along chosen the least heating stimulants. What probably gave rise to the opinion that carminatives, of which oil of anniseed is one of the principal, dispel wind, is, that after they are taken, the wind brought up smells of them: a circumstance, which on reflection, will be found to afford the strongest proof how very difficult these substances are to digest, and that it is owing to their continuing to retain their pristine form, that the wind which is expelled is scented with them. If any stimulant is wanted, camphire seems the most proper, as being of a diaphoretic quality, and greatly resisting putrefactions, as well as taking off spasms. M. Bourgelat recommends it much in the contagious and inflammatory diseases of cattle, given in the quantity of two drams or more in a day, either dissolved in a little spirit of wine, and added to any other draught, or given in a ball. Nitre, in like quantity, makes it a still better medicine.

S E C T. III.

Of a Fever.

AFEVER is a cold greatly increased, but generally without a cough. When a horse is ill of a fever, he droops his head, his eyes look staring, and are sometimes red and inflamed, his mouth and tongue are hot and dry, his lips hang down,

down, he appears dejected, and seems to have a weariness all over his body: his limbs burn with heat, his pulse beats strong and quick, at the rate of about fifty times in a minute: he fetches his breath short and quick, staggers in his gait, loaths his food, wants often to drink, stales with difficulty, his urine is high coloured, he is restless, seldom lies down, and if he does, he soon rises again. Vegetius observes (*a*), that if the fever proceeds from his having been worked beyond his strength, his eyes will be blood-shot, and he will appear to support himself best on his hind legs; for he will set down his fore feet as if they were bruised or foundered.

The cure should here begin with plentiful bleeding, which should be repeated, if necessary, on the same, or the succeeding day or days, lessening the quantity at each time, from about three pints or two quarts to a pint: and as in all fevers the excrements are generally hard, they should be taken out by the hand as much as possible, and the body should then be opened with a stimulating glyster, such as a decoction of four ounces of tenna added to a common decoction; or six or eight ounces of antimonial wine added in like manner.

Internally, the same mild medicines may be given as are directed in the foregoing article. Nitre, to the quantity of an ounce a day, either mixed with honey and made up into a ball, or put into the horse's drink, is of great use. He should be tempted to drink plentifully, by giving him such mashes as are pleasing to him; and therefore whatever is disagreeable should be administered with a horn, lest the fear of that disagreeableness should deter him from drinking.

(*a*) *Lib. I. c. xxx.*

When the first violence of the disease is abated, or when the strength of the sick creature sinks, medicines of a more stimulating nature may be given. If the *Spiritus Mindereri* should be thought too expensive for horses, the following mixture, recommended by Mr. Bartlet (*b*), may answer the same purpose. "Take of Russia pearl-ashes
 " one ounce, of distilled or common vinegar as
 " much as shall perfectly saturate the salt, or so
 " much, that when more vinegar is poured upon
 " the mixture no effervescence will arise, a quart
 " of water, and four ounces of honey. Mix these
 " well together, and give a pint of this drink three
 " or four times a day." Sir John Pringle, Bart. acquaints us (*c*), that in Dr. Clerk's opinion, of all the neutral salts, the crude sal ammoniac comes the nearest to the *Spiritus Mindereri*; and therefore it may be used here with great propriety, to the quantity of an ounce a day.

Instead of opening the body with purges, in fevers, it is more adviseable to repeat the glysters, so as to obtain that end; but less stimulating than the first. Whey, water-gruel, pot-liquor, with salt and oil, may be sufficient.

Vegetius, in his usual way, recommends (*d*), especially in the winter, to rub the diseased horse with oil and vinegar long against the hair, and then to cover him, and carry him to a warm place. He also advises other particular modes of treatment peculiar to each season: but all his prescriptions are so loaded with a multitude of ingredients, that it would be very difficult to ascertain the virtues of any one of them in particular.

(*b*) Page 33.
Army, part III. c. i.

(*c*) *Observations on the Diseases of the*
 (*d*) *Lib. I. c. xxx.*

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In summer, the best food for a feverish horse is green succulent plants; and in winter, a little hay moistened with water; but no corn. He will eat but little at first; but if the disease does not last above three days, he will soon come to his appetite. If it exceeds that time, give him a masticatory made of assa-foetida and savine, of each half an ounce, an ounce of liquorice rasped, and an equal quantity of sugar. This will cause a discharge of any matter that may load the glands, about the mouth and gullet, and so quicken in him a desire to eat. His drink should be given him rather often than much at a time, and he should be kept moderately warm; the extremes on both sides being equally hurtful, and perhaps most so on the side of heat.

The horse's returning appetite, and the cooler temper of his body, shew a recovery of health; and then some mild purgatives should be given, such as the purging salts before directed, or cream of tartar with a dram or two of jalap in powder to quicken it. Frequent rubbing contributes much to restore health.

Mr. Bartlet (*e*) gives the following signs of a fever which he has observed to seize horses. This fever is slow, with languishing and great depression; the horse is sometimes hot in the mouth, though he is outwardly cold; at other times hot all over, but not to any extreme; his eyes look moist and languid; he has a continual moisture in the mouth, which is the reason why he seldom cares to drink, and when he does, it is but little at a time; he feeds but little, and leaves off as soon as he has eaten a mouthful or two: he moves his jaws in a feeble loose manner, with an unpleasant grating of his teeth; his body is

commonly open; his dung soft and moist, but seldom greasy: his staling is often irregular, sometimes little, at other times profuse; seldom high-coloured, but rather pale, with little or no sediment. A horse in this sort of fever always runs at the nose, but not the kindly white discharge, as in the breaking of a cold; but of a reddish or greenish dusky colour, and of a consistence like glue, and sticks like turpentine to the hair on the inside of the nostrils.

When, in this state, a horse's appetite declines daily till he refuses his meat, it is a bad sign. When the fever does not diminish, or keep at a stand, but increases, the case is then dangerous: but when it sensibly abates, and the mouth grows drier, when the grating of his teeth ceases, when his appetite mends, and when he takes to lying down, which perhaps he has not done for a fortnight; these are promising signs. If the running at the nose turns to a gleet of clear thin water, if the horse's hide keeps open, and if he mends in his appetite; these are signs of recovery.

The various and irregular symptoms which attend this slow fever require great caution and skill to direct the cure. In general, a moderate quantity of blood may be taken, proportioned to the horse's strength and other symptoms. In order to determine this quantity, the pulse in the neck, where it is very apparent, should be examined, and it's frequency and strength should determine the quantity; for it's hardness, more than it's frequency, is what indicates the necessity of bleeding. The bran and water with nitre, and an ounce of snake-root in it, may then be given, as before directed. As the stools in this case are frequent and loose, there appears not any need of a glyster; but a somewhat that will purge smartly seems to be wanted. An ounce
of

of jalap, with a dram of calomel, made into a ball, will give that degree of stimulus which shall expel either slime, or worms, that may become an additional cause of this fever. If, after this, the fever still wears the same aspect, a dram of camphire dissolved in spirit of wine, and a pint of strong vinegar, may be added to the former mixture. Sweet hay should be given frequently, and by little at a time, because the horse's breath may taint it if it stands long before him.

If the looseness is too great, proper remedies should be given to restrain it, such as water in which a good deal of chalk is mixed, or disacordium to the quantity of half an ounce; and every thing that may excite a purging should be avoided. If the horse stales in too great quantity, the nitre must be discontinued; but if he does not make water enough, it will be right to give him a decoction of juniper-berries, with some Venice turpentine, first dissolved in the yolk of an egg.

When the horse begins to put on a more lively look, when his hair appears smooth and glossy, when his nose grows clean and dry, when his urine shews signs of concoction, when his appetite mends, and when he lays down well, and both stales and dungs regularly, health is returning. Particular care should then be taken, that his diet at first be light, and in small quantities, and that it be increased only by degrees as he gets strength; for by over-feeding on recovery from a long illness, there is great danger of a relapse, or surfeit, which are always difficult of cure.

If the fever should prove of the intermitting kind, immediately after the fit is over, give an ounce of Jesuits bark, and repeat it every six

hours, if the fever is discontinuing, till the horse has taken six ounces. Eruptions, or swellings of any kind, are to be encouraged in the decline of a fever, because they denote a termination of the disease.

Here I would beg to establish as a general rule in all diseases, and on this occasion apply it particularly to the horse, that the atmosphere be continually changed by the admission of fresh air, without it's blowing upon the diseased animal: and this may easily be done by having an opening in the cieling of the stable, to carry off the foul air.

The putrid fever is most apt to seize young horses, especially in hot weather, and in hot countries. It is distinguished by the tongue and palate, which become black, dry, and hard; the whole body is hot, the head hangs down, the eyes are red, the breath is hot, and the heart beats much.

The cure consists chiefly in bleeding, and a very cool diluting diet; to which end we find an ounce of crude sal-ammoniac dissolved in the horse's drink, and stimulating glysters recommended. For the farther treatment of this disease, and also what is necessary to be done in contagious or pestilential disorders, the reader is referred to the latter end of this volume, where those matters will be professedly treated of. In the mean time I shall add here, as pertinent to my present subject, the substance of Mr. Osmer's account of a contagious disease in horses which fell under his own eye.

"In the year 1750, I think it was, says Mr. Osmer (*f*), that the distemper among the horses was more universal than at any other time.

(*f*) *Treatise on the Diseases of Horses*, p. 108, et seq.

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Various were the symptoms, and different the degrees of illness among different horses. Some had a discharge of matter from their eyes, nose, and mouth; others had none: but in all there were great tokens of inflammation, attended with a fever and a violent cough.

“ Most of the horses which had a discharge from the nose, &c. lived; and where such discharges did not happen, nor a critical abscess fall on some part, most of them died.

“ I made several incisions in the skin on various parts of the body of dead horses which had not any discharge from the nose, and found in all of them a quantity of extravasated serum lodged between the skin and the membranes. This indicated the propriety of several rowels, which some were of opinion would soon mortify: but in about thirty hours their good effects appeared; for the horse thus treated began to look chearful, and to eat his meat, and in another day became as apparently well as ever he was in his life. Rowels had the same good effect on horses which had a discharge at the nose: for they got over it much sooner than those which had no such assistance.

“ If a horse has a violent fever, with a dry cough, and there be no concomitant discharge at the nose, he should be bled largely. If a discharge at the nose appears, bleeding will be found to do harm; being contrary to the attempt of nature in such discharge. In both these circumstances, he should take cooling salts every six hours, the excrements being raked from him if he is costive; cooling glysters should be given, and three or four rowels should be put into various parts where the skin is loose.

“ The danger of a mortification has been objected to these rowels: but if any such symptom

as a gangrene should appear, on this or any other occasion, warm fomentations, with some spirit of wine added at the time of using them, and a poultice made of oatmeal, cummin seeds, and the grounds of strong beer, and kept applied to the part, are the proper remedies.

" A stud of mares and colts of various ages were attacked with this distemper in various forms. Some had a discharge from the eyes, nose, and mouth; some had critical swellings, which fell on the udder; some were on the shoulder, others on the side of the jaw, under the jaw, and on the other parts.

" As they fell ill, they were taken to a house, and bled or roweled according to their different ages and symptoms, and saltpetre was given them: by these means they all became well, except the sucking foals.

" When critical swellings appeared, I made large incisions on the part, and let out large quantities of matter. So much was the blood vitiated, that after the first wound was well, many of them had other critical swellings fall on other parts, again and again; these were all opened, when ripe, and by this means they all at length became well. Some had several setons put in the skin, some in the depending part of the swelling, thinking by these evacuations to divert the febrile matter, and effect a cure: but after a trial of many days, I found this method of no use, the swelling all this time neither advancing nor receding. Upon which the setons were taken out, the saltpetre left off, and in a few days the swelling came to good matter, by the discharge of which the animal got well in due course of time.

" But for the sucking foals, no remedy availed; the disease baffling all the attempts of

art and nature. If you bled them, a swelling perhaps came on the part, and would remain indurated for several months, which was neither to be dissipated, nor brought to matter. The same kind of indurations would also fall on other parts. If the matter was formed and let out, fresh swellings succeeded each other; or some other symptoms of the disease remained for several months, even till they were weaned. The cause of this I think is evident. The mare that gives suck is never, at least that I could perceive, affected with this disease; which in all probability proceeds from the constant secretion of her milk, by means of which her vessels are still kept emptied, and herself free from any symptoms of a fever, and yet her blood may be much vitiated and corrupted.

“ I have seen several foals at the mare's foot, whose blood has been so poor, as to occasion their legs to swell, even when they have been running about in the field, and must inevitably have died, if they had continued to suck much longer: yet, when taken from the mare and weaned, have been soon recovered, by the very means that before were found ineffectual. From which instances I am ready to conclude, that this long continued illness of the foal is entirely owing to the depravity of the mare's milk.

“ In order to remedy both mare and foal, the mare should be bled two or three times, and take some cooling salts every day; and the same should be given to the foal once a day, or oftener, if there be occasion, with the use of setons. The milk of the mare should be drawn from her, unless it is intended to wean the foal: otherwise, such foal should be supported with cow's milk mixed with flour, till his health is re-
instated,

instated, by which time the habit of body in the mare will also be amended.

“ When a critical swelling appears on any part, all means used to divert it are wrong, and ineffectual: but a poultice of bread and milk should be applied to the part, to forward the matter, which, when ripe, and not before, is to be let out by a proper incision; and to prevent any future swellings on the same, or other parts, some discharge should be continued for a time by an artificial drain, with the daily use of some cooling salts to correct the vitiated blood.

“ I have of late followed a method somewhat different from rowels or setons, though analogous thereto, and think it much better than either of them, because it sooner brings on a discharge, and that in greater abundance, is attended with less inflammation, and may be continued as long as one pleases. It is, to make a number of incisions into the skin on any part where it is loose, to dilate or separate the same with the finger all round as far as it will reach, and moderately to fill such part every day with lint or tow dipt in a proper digestive for wounds; first taking out the former dressing.

“ By these methods, all the symptoms attending this disease, in every age, will be removed, and it's destructive consequences prevented.

“ The use of cooling salts, with proper bleeding and glysters, will generally be sufficient to remove most common fevers: yet if the case appear urgent and dangerous, then, by way of security, incisions of the skin, as drains, should be used also. For want of such secretions and evacuations, the horse, though he may chance to recover from his fever, is liable to, and often is ruined by consequential disorders, such as the farcy, a broken wind, tubercles of the lungs,

consumption, glanders, and œdematous local swellings, that are never removed.

“ In this disease, which I own is new to me, the horses are seized with a variety of symptoms that require a different treatment. On this account, particular regard is to be had to the symptoms attending it, as the proper indications how to act; and with such attention, the methods here directed will seldom fail to answer the desired end.

“ This disease begins, in general, with great debility of the limbs; and many horses are so much weakened, as to reel and stagger about when led along, and that almost as soon as they are taken ill. It is attended too, in general, with loss of appetite, a dry cough, their eyes become suddenly dim, glazed and lifeless, and they have no sort of inclination to drink.

“ But there being, I think, five different classes or degrees of this disease, I shall endeavour to distinguish them as clearly and concisely as I can, for the information of the reader.

“ *First.* Besides the symptoms already mentioned, some horses are taken with a coldness of the external parts: these are chiefly affected with a weakness behind; they have no fever, nor tokens of inflammation, and there seems to be a tendency towards a general stagnation of the fluids.

“ *Secondly.* Among other symptoms, are great tokens of inflammation, the fever is high, and the external parts are hot and burning. These horses are most affected in their head and sight.

“ *Thirdly.* In others, the disease falls on the throat, with manifest tokens of great soreness. These seldom have any feverish heat, are not so much

much affected in their limbs, or sight, as some are, and their appetite, both for eating and drinking, seems better than in those of the first and second class. They are, in general, miserably reduced before this soreness goes off; though their falling away ought not to be imputed solely to their fasting, because all horses that have this disease to any considerable degree, are reduced in a very few days to the leanells of a dog-horse.

“*Fourthly.* Others are seized at first with a cough only, and shew little or no symptoms of illness, nor of any unusual heat or cold. These, in general, soon have a discharge of a serous fluid, from the nostrils, as in the inflammatory fever. They are least affected, and recover soonest of any, and frequently too without any assistance at all.

“*Fifthly.* In others again, the phlegmon, or boil, appears soon after the cough, in some part of the head and body; and in some of these the vital heat is sufficient speedily to bring on a critical imposthumation, without any art or assistance. In others, the vital heat is so little, that their lives are manifestly endangered before an imposthumation can be obtained, even with the assistance of art.

“ But when we talk about vital heat, it may perhaps be more proper to say, that the different progress of the critical boil in different horses, is owing to the difference of their fluids, and the more brisk or languid circulation thereof, as they happen to be more or less viscid. If this be not the true cause, from whence, I pray you, arise the two extreme sensations of cold and heat in different horses, affected with the same epidemical disease? It may be observed too, that those horses are most affected with cold and

shivering, in whose blood is found the least serum.

“ Having now described the different symptoms of this disease, I shall subjoin the different methods of treatment.

“ To those of the first class, bleeding is particularly found to do harm; and if it be done in any great quantity, the horse soon drops, a violent palpitation of the heart succeeds, and death most probably follows speedily. The blood of these, when taken away, and exposed to the air for twenty-four hours, has not a drop of serum in it, but remains a coagulated fizy mass: nor do these, when costive, bear the evacuations by glysters with advantage, but rather with the contrary effect; and rowels also seem to do harm to horses under the circumstances here described. For these, the following medicine will generally produce, in a few days, the desired effect.

“ Take of crude sal ammoniac and nitre, each one ounce; of Castile soap half an ounce; of camphire rubbed with a little cold-drawn linseed oil, two drams; and of mucilage of gum arabic enough to make these up into a ball or two, for one dose. Give it three times a day.

“ But if, on the use of these medicines for a few days, the urinary secretions appear not to be enlarged, or the symptoms do not abate, then the quantity of nitre and sal ammoniac ought to be increased, according to the size, strength, and habit of body of the horse. His proper food at the beginning is hay and scalded bran, if he will eat it: his drink should be moderately warm, of whatever he likes best, and as much as he chooses.

By the continuance of this medicine for a few days, as the stagnated fluids become thinner, the bodily warmth and strength increase; and
soon

soon after, as the urinary secretions appear to be augmented, he begins to drink freely; upon which he generally becomes on a sudden well, recovers his limbs and his appetite at once, and is free from all complaints but his cough, which perhaps leaves him not entirely, till he recovers flesh.

“ When these symptoms appear, and the horse's appetite is good, leave off those medicines, lest the fluids should become too much attenuated, and so a dropsy ensue. Avoid likewise the use of all other medicines at this time; for nature now will, in general, best do her own work, without art. Bran and oats scalded together are now his proper food. During his whole illness, he should not be taken out of the stable on any account; nor afterwards, till he has recovered his flesh, and been purged, which probably he will not be able to bear for a considerable time; and as in the inflammatory fever, keeping the horse cool is very beneficial, so in this disease, keeping him moderately warm, with good rubbing, if he is inclined to be cold, and stiff in his motions, is very necessary.

“ For those of the second class, bleeding in a moderate quantity is very beneficial, especially at the beginning of the disease. Here too evacuations by glysters will be of use, and the medicines before directed should be given in like manner. If the heat and fever continue twelve hours, and the vessels on the membranes about the eye appear inflamed and distended, a second bleeding in a moderate quantity may be necessary, and will generally be sufficient: but in this, or future bleedings, the direction for so doing is to be taken solely from the tokens of inflammation; remembering, that in this disease the

the horse can bear the loss only of a small quantity at one time; and having likewise some regard to his size and strength.

“ The blood in horses labouring under these symptoms is very fizy, of a buff colour, and has but little serum, when it has stood for a time. In this case, therefore, rowels will be improper, because they promote a discharge of the lymph and finer fluids, of which there appears to be already a deficiency, or rather some degree of stagnation in the circulation thereof.

“ For such as are affected with a soreness of the throat, bleeding, glysters, and rowels are all improper, unless there be manifest tokens of fever and inflammation: in either case, the medicine before directed is proper. These horses will eat bread and water-gruel together, if made thin.

“ For those which have a discharge at the nostrils, bleeding is highly prejudicial, because this is an effort of nature, and a kind of crisis to get rid of the disease. Glysters too are seldom wanted here, because the horse in these circumstances generally has appetite enough to eat a quantity of scalded bran, sufficient to keep his body open: but rowels, with the medicine before directed, help here to assist nature in unloading the over-charged vessels, and getting rid of the extravasated fluids; for though many horses do well in this situation by the help of nature alone, without any assistance, yet I have seen many instances, both in this fever, as well as in the inflammatory, where, for want of these artificial helps, the extravasated fluids discharged at the nostrils have been of so sharp a nature, as to corrode the soft membrane which lines the internal cavity of the nose, and there produce ulcers,

ulcers, which, lying out of the reach of topical applications, often turn to the real glanders.

“ For the fifth class, a poultice of bread and milk with lard should be applied twice a day to the boil; and it might reasonably be deemed very proper, where the pulse is low, the circulation languid, and the external parts cold, to give the horse some warm alexipharmic medicines, to enable nature to bring on the work of suppuration; but I have found in several instances, that such medicines are on this occasion of no account at all; for where I have perceived the blood to stand still for many days, without advancing in the least towards maturation, and the horse has been in manifest danger, I have left off the use of warm medicines, and have given the medicine before directed, with camphire, thinking by this means to thin the fluids, and so to carry off the disease by the other common secretory ducts; and this has succeeded: but what is remarkable, and, I believe, contrary to speculative reasoning, the phlegmon or boil, which before stood still, and would not advance at all, has soon after, when the urinary secretions have been enlarged, come to suppuration; and though this may appear somewhat strange to the learned, yet it ought to be remembered, that bleeding has sometimes brought the phlegmon in men to suppuration, which before made no advances thereunto.

“ By these different methods I have saved the lives of many horses, having lost a few only out of a great number; though I am ready to acknowledge, that, when this disease first made its appearance, I endangered the lives of many.”

Vegetius^(g) describes a contagious fever similar to the above, only he divides it into two classes,

(g) *Lib. I. c. iii. et v.*

namely,

namely, that with the running at the nose, and that with the tumours in the skin. Speaking of the former, he says, "there flows from the horse's nose, instead of snot, a stinking and thick humour, of a pale colour: the horse has a great heaviness in his head, and hangs it down: tears fall from his eyes, and there is a wheezing noise in his breast: he becomes thin and meagre, with his hair standing on end, and of a sad aspect. The antients called this disease the Attican flux. When a bloody or a saffron-coloured humour begins to flow from his nostrils, he is incurable." And of the second he says, "there arise in the body of the horse ulcers, out of which flows a liquid greenish humour, without any discharge from his nose."

He (b) makes the cure consist chiefly in mild oily injections into the nose, anointing the head with warm oil, keeping the head warm, and giving *Diapente* made in this manner. Take myrrh, gentian, long birthwort, bay-berries, and shavings of ivory, of each an equal weight, made into a fine powder. Of this mixture, give the first day a spoonful heaped in a pint of old wine; the second day a spoonful and a half, and the third day two spoonfuls. In another place (i) he tells us, that, when the pestiferous humour passes between the skin and the bowels, it is to be cured, by making an incision in the skin, or applying a cautery, in the usual place, between the shoulder and the belly, by which a corrupted yellow humour will be discharged. If it flows in small quantity, he advises inserting into the wound the root of tithymal or spurge, which will bring out the remainder of the venom. A cautery may be applied to the breast of the horse, and when the

(b) *Lib. I. c. x.*(i) *Ibid. c. xii.*
eschar

eschar is cut, the root is to be inserted, and will remain there till the slough falls off, whereby the humour is drawn out of the whole body; the horse taking the *diapente* in the mean time.

S E C T. IV.

Of Fevers attended with Inflammations in particular parts.

SO long as the signs of an inflammatory state of the blood appear over the whole body uniformly, the Fever is called simply an inflammatory Fever; but when the disease falls on some other part, the Fever then takes a denomination from the part affected. I shall begin with the head, and from thence proceed downwards.

Vegetius (a) observes, that when, by reason of excessive heat or cold, the vessels of the brain are distended, wholesome sleep is excluded; from whence a head-ach, sadness, and weakness, necessarily follow. These are the signs of the lightest indisposition of this kind: but when the vessels are greatly over-charged, and on one side only, the animal is affected with the staggers, his sight is weakened, tears frequently run down from his eyes, his head is heavy, and he leans it against the manger; his ears are motionless. As his disorder increases (b), he is seized with a phrenzy, leaps suddenly, as if he wanted to make his escape, dashes himself against the wall, and cannot be kept in by any method whatever. When the pulse and quick-breathing indicate the symptoms to be attended with a proportionate

(a) *Lib. II. c. i.*

(b) *Id. ibid. c. viii.*

degree

degree of fever, we may judge that the brain is inflamed.

Plentiful bleeding, to the quantity of four or five quarts, is here the only immediate relief, and should be repeated in such proportion as the strength of the horse can bear. The body should be opened by a glyster, and, as before directed, the animal should be put under the most cooling regimen. Vegetius recommends the addition of mustard-blisters. I do not know that the experiment has been made; but I can see no reason why the practice on the human body, of shaving the hair on the hind part of the head, and applying a mixture of the flour of mustard and Spanish flies made into an adhesive paste, should not be followed here. It seems at least not to be attended with any danger. He directs also (c), that the head be well rubbed with oil, and that a cataplasm composed of bay-berries, rice, nitre, vinegar, and oil of roses, be applied warm, in the winter, wrapping up the head in a skin with the wool on it.

He (d) distinguishes this disease from real madness, in which the horse will neigh as if he were in perfect health, fall upon either horse or man and bite them, bite or gnaw the manger, and even his own flanks. In this last case, he advises to give him green food, and chiefly as much green parsley as he will eat, six spoonfuls of the juice of hemlock in half a pint of water, with other due evacuations (e). If the hydrophobia is come on (f), with a trembling, grinding and gnashing of the teeth, he must be put in a dark place, and water should be set by him in a bucket, in such manner that he may not hear the sound of

(c) *Lib. I. c. xvi.* (d) *Lib. II. c. xi.* (e) *Lib. III. c. xliii.* (f) *Ibid. c. xxxi.*

it. He must be well secured, that he may not hurt the person who attends him. In all diseases of the head, which continue obstinate, he advises the use of the actual cautery, in such places as it shall make the least blemish in. If the hydrophobia does come on, it is not worth while to risk his biting any attendant. A ball should then be the cure.

Vegetius (g) observes, that though the horse may be cured of this disorder, yet his brain is sometimes so much affected or injured, that he remains heavy, stupid, and unfit for business. It is with difficulty he can turn himself to the side on which the inflammation was: he will lean on that side against a wall, and, not feeling the whip, go slowly, and hanging down his head; he loses all gracefulness of gait.

Columella (h) speaks of a species of madness which sometimes seizes mares, though seldom. The signs of this are, that they run up and down their pasture, as if they were put to the spur, after looking round them as if they were seeking for something. He adds, that this phrenzy is cured by leading them to a water where they may behold themselves at full length, and from thence presumes that it takes its rise from their love of themselves, and their having before seen only their head in the water.

The authors of the *Maison Rustique* mention (i) a disorder which the eyes of horses are subject to on the decrease of the moon, and is therefore called *lunatic*. The method of cure which they prescribe is very proper for any disorder of that kind, come when it will; namely, putting a seton in the nape of the neck. They propose, that

(g) *Lib. II. c. v.*

(h) *Lib. VI. c. xxxv.*

(i) *Tom. I. p. 242, of the 7th edit. 4to.*

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the cord be composed of half hair and half hemp: this cord is anointed with any ointment, and drawn through the incision, as is usually done in men.

Though the following do not properly belong to inflammatory disorders, I shall however comply with common custom so far as to mention here Apoplexy, Epilepsy, Convulsions for which no apparent cause can be assigned, Palsy, and Lethargy; all these being supposed to proceed from the Brain.

S E C T. V.

Of Apoplexy, Epilepsy, Convulsions, Palsy, and Lethargy.

AN *Apoplexy* seldom gives any previous sign of it's attack, unless when it becomes itself only a symptom of Inflammation and Fever. The horse is sometimes observed to have watery eyes, or inflamed, to be drowsy, and to stagger in his gait. If, after such symptoms, he falls down suddenly, without any other sense of motion than a working in his flanks, there may be hopes of his recovery by very plentiful bleeding. The bleeding should be continued till there appear some signs of his recovering his sensibility. If he drops suddenly, without any previous appearance of indisposition, he affords but little room indeed for hope; though bleeding as above should be tried, keeping his head raised a little above the level of his body. If he recovers from the fit, glysters made of a decoction of fenna and salts should be administred immediately, as well as the body opened by powerful purgatives given internally: externally, a seton, rowels, and friction,

tion, should be used; and assarabacca blown up the nose is thought to draw off the humour by the glands of the nose.—The *Staggers*, when not proceeding from some apparent cause, is an apoplexy in a less degree, and should be treated in the same manner.

In the *Epilepsy*, or *Falling-sickness* (*a*), the horse's eyes are fixed in his head, he stales and dungs insensibly, he reels, and falls suddenly. He has generally very strong involuntary or convulsive motions; at other times he is immoveable, with his legs stretched out as if he was dead, excepting the motion in his flanks and breast, and after he has continued thus for some time, even to some hours, he recovers on a sudden, and at the going off of the fit foams at the mouth. Vegetius says (*b*), that according as the cartilage in the nose is more or less cold to the touch, the returns of the epilepsy, or convulsions, will be more or less frequent.

No cure having yet been found for the epilepsy in mankind, there is the less reason to expect one for horses. Some writers have an opinion of the gums, for the epilepsy and convulsions; and accordingly advise the giving of assafoetida, galbanum, &c. to the quantity of two drams, or half an ounce; or two drams of Russian castor made into a ball, with one ounce of wild valerian root powdered, and honey: but the chief dependance is to be made upon antimony and it's preparations, given as an alterative, to restore the impaired state of the viscera, and of perspiration.

That universal cramp or convulsion, called by some the *Stag-evil*, which seizes all the muscles

(*a*) Bartlet's *Gentleman's Farriery*, p. 82.

(*b*) *Lib. III. c. xxxiii.*

of the body at once, and locks up the jaws, so that it is almost impossible to force them open, is thus affectingly described by Mr. Gibson. "As soon as the horse is seized, his head is raised with his nose towards the rack, his ears pricked up, and his tail cocked, looking with eagerness as an hungry horse when hay is put down to him, or like a high-spirited horse when he is put upon his mettle; inasmuch that those who are strangers to such things, when they see a horse stand in this manner, will scarce believe any thing of consequence ails him; but they are soon convinced when they see other symptoms come on apace, and that his neck grows stiff, cramped, and almost immovable; and if a horse in this condition lives a few days, several knots will arise on the tendinous parts thereof, and all the muscles, both before and behind, will be so much pulled and cramped, and so stretched, that he looks as if he was nailed to the pavement, with his legs stiff, wide, and straggling; his skin is drawn so tight on all parts of the body, that it is almost impossible to move it; and if trial be made to make him walk, he is ready to fall at every step, unless he be carefully supported: his eyes are so fixed through the inaction of the muscles, as gives him a deadness in his looks: he snorts and sneezes often, pants continually with shortness of breath; and this symptom increases till he drops down dead; which generally happens in a few days, unless some sudden and very effectual turn can be given to the distemper."

Vegetius (c) divides this illness into several states. The first, in which the creature is bereaved of his senses, has his eyes open, but is

not sensible of what approaches him, and his lips swell as if he was poisoned or infected, is a most malignant, and, as he says, infectious disease. In it's next state, the whole body is bound fast, the nostrils are extended, the ears are stiff, the neck is immoveable, the mouth is shut fast, the head is extended, the shoulders and legs are pinioned, and the joints so stiff that they cannot be moved; his spine is exceeding stiff, his tail is raised, and so stiff that it can neither be bent nor moved; his flanks are hard and pulled in, and he is unable to lie down: he refuses to walk, though force be used, and then he frequently falls under his hinder parts; he fetches his breath with difficulty, sighs often, snorts, draws up his flanks, and coughs when he attempts to eat, and his skin is stretched and tight.

"This disorder, says he (*d*), arises from the following causes, in the summer: the horse's being struck with a burning-hot sun, or his becoming lame upon a journey, and being forced to run on, till, from exercise and pain, he falls into a great sweat; and in the winter, from his being suffered to stand in the cold air, or in a damp or new-built stable, when he has been heated, or when his jaw-bones in particular have been benumbed with cold." He tells us, that this disorder may be cured in the summer, but not without great difficulty in the winter. To this end, he begins with plentiful bleeding, and then anoints the whole body with oils made very warm. He then orders the horse to be covered all over, and buried in his own warm litter and dung, so that the distemper may exude by the skin. As the horse begins to mend, he should be covered with cloths, and exercised by a rider

in the warm sun till he sweats; he is then to be well rubbed, and again anointed and clothed.

The treatment of the human species in the locked jaw, and in similar complaints, has taught a more effectual cure for horses. Mr. Gibson therefore wisely advises an ounce of opium dissolved in a glyster, and then to add to it an ounce of assa-foetida. The use of these must be continued daily, till the symptoms abate, and the horse is able to swallow food: and as he may remain for several days in this condition, it is necessary to give him from time to time nourishing glysters, composed of the most nutritive vegetable decoctions, in such quantities as not to endanger their being thrown out again by their too great load, or over-potent stimulus. Camphire should be added to the ingredients they are anointed with: for example, if dissolved in oil of olives and oil of turpentine, of each one ounce, and of the nervous ointment four ounces, it will form a mixture which may be kept for use, and will be found very serviceable. The head, neck, back, and loins, should be anointed a long time. While the skin remains so tense, as it is in this disease, no digestion can be procured in any incisions, and therefore rowels are not to be attempted, lest they should mortify, and thereby add to the violence of the symptoms.

Palsy and *Lethargy* are also imputed to faults in the brain, and therefore classed with the foregoing disorders.

The last of these is thus described by Vegetius (e). A horse affected with a lethargy will constantly lie and sleep, and has no appetite for either meat or drink: after he has been roused,

(c) *Lib. III. c. xli.*

he presently becomes heavy again, and throws himself down; he grows lean; the tears run from his eyes as if he was blear-eyed; he sometimes leans upon the manger and sleeps; when he walks, he staggers with his hind legs.

Bleeding is necessary here to empty the overcharged vessels, with stimulating glysters, and then purges, to clear the bowels of any matter imparted in the glands. In all other respects, this disorder may be treated nearly in the same manner as the foregoing. The horse should be kept from sleep by frequent exercise, and constantly roused with the whip or voice. If a well-digested discharge flow from his nose, and the horse be young, there may be hopes of a cure: but if an ill-coloured matter is discharged, and the horse is old, and very sleepy, there is little room to expect his recovery.

S E C T. VI.

Of Inflammations and other Disorders of the Eyes.

THE Eyes, like all other parts, are subject to Inflammations, which, if attended with any degree of fever, require immediate bleeding. If any vein appears turgid near the eye, that in particular should be opened preferably; and the body too should be opened with a glyster and a cooling purge. Externally, mild applications are certainly most proper while the inflammation continues high, such as, apples roasted, turnips or carrots boiled, and mashed with some oil upon them, and applied as a poultice. It is also proper to wash the eye with warm milk and water. A cooling treatment of this kind may carry off

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the inflammation; whereas the sharp warm applications commonly used, increase the pain and inflammation by their irritating quality. If the inflammation ends in a suppuration in the eyelids, or on the external coats of the eye, honey mixed with the apple or other poultice becomes an excellent detergent and healing medicine.

Whether the inflammation proceed from an internal cause, such as an inflammatory fever settling on that part, or from an external cause, such as blows, dust, &c. the applications should be nearly the same. If any extraneous body rests in the eye, that body should certainly be got out, by washing the eye with milk or some other mild application. If a large swelling arises from a blow, and the skin is not broken, vinegar and water may assuage it, or a poultice made of them and flower may be applied; but if the skin is broken, neither vinegar nor any sharp acrid substance should be used, lest they should form upon the sore a slough, which must be cast off by a consequent inflammation; whereas mild applications would bring on a kind digestion at first, and a speedy cure.

A constant irritation, and consequent inflammation, may arise from the eye-lashes being turned in upon the eyes. In this case, it seldom is sufficient to pull out the hairs, because the young hairs that succeed them will probably take the same bend, and if they do, that part of the eye-lid must be cut off as deep as the roots of the hair reach. However, before we proceed to this extremity, Vegetius (a) advises to make an incision with a lancet on the inside of the eyelid, then to turn the lid outward, and by proper plaister and bandage keep it so, till the incision is cured, and by this means the growing of the hairs inward prevented.

(a) Lib. II. c. xv.

When,

When, by the continuance of any irritating cause, the vessels have remained long turgid, and have by that means lost their strength, or tone, it is necessary to use applications which at the same time cool and stimulate. Such is the common and very proper application of the white of an egg beat up with some allum, spread on lint, and applied to the eye. A weak solution of white vitriol, or ointment of tutty, is likewise proper. Sugar of lead mixed with a cooling ointment is here very efficacious. Sir John Pringle (*b*) recommends the following form: Take of white ointment five drams, of sugar of lead one scruple, to which add by degrees two scruples of the traumatic balsam, to be rubbed into, and laid on the eye. With this view Sir Hans Sloan's ointment is used, which is the tutty made into an ointment with viper's fat. Conserve of roses has long been a favourite application for this purpose. The eyes should be washed with the liquids three or four times a day, and a cloth dipped in them should be applied between whiles. The ointments are best administered with a feather, or rather a brush made of the softest hair, drawn through a quill. The eye-lids should be so far opened, that the medicine may penetrate between them and the ball of the eye, in order that there may not remain there any matter which, becoming acrid, would add to the irritation. Mr. Gibson (*c*) recommends the following wash: Take two drams of rose-buds, infuse them in half a pint of boiling water; when cold, pour off the infusion, and add to it twenty grains of sugar of lead. Vegetius (*d*) commends much the use of

(*b*) *Observations on the Diseases of the Army, Part III. c. ii.*

(*c*) *Farrer's Dispensary, p. 148.*

(*d*) *Lib. II. c. xx.*

celadine in disorders of the eyes; and indeed, if we attend to it's efficacy in discussing swellings in the human body, I think not without foundation.

If a defluxion falls on the eyes from an internal disorder, or a vitiated state of the blood, the cure of the original complaint must be first set about, by giving such medicines as are necessary for that disorder. In strumous cases, a decoction of hemlock is found to be of great efficacy in men, and may therefore certainly be used in obstinate cases in horses: and so may likewise ground-ivy. In other respects, the external treatment may be the same as before directed.

From whatever cause the inflammation arose, if it continues, the external coats of the eye may be so much thickened as to become opaque, and thereby impair the sight, or even totally destroy it. Sometimes an abscess is formed, which, by the cicatrice it leaves, destroys the sight. Excrescences may also grow: these may be cut off, and if the film or cicatrice which is on the sight rises in the least prominent, it may be separated by a steady hand. If the veins on the ball of the eye appear all turgid, and do not give way to any of the applications already mentioned, the eye may be rasped, if I may use the expression, with a brush made of the awns of barley tied at the small ends, and used so that the awns touch the eye against their grain. This opens these superficial vessels, and so discharges their stagnant contents. The white vitriol, sugar of lead, &c. will then cool and heal up these superficial sores.

In a general opakeness without inflammation, the custom is, to blow into the eye such things as, by their roughness, or angular surfaces, shall wear down the opaque skin, and by that means restore the sight; such are white vitriol, alum, fine sugar, sugar-candy, &c. in powder, and

blown

blown through a quill into the eye. The smart which they occasion excites a frequent motion in the eye-lids, and consequently a friction against the opake skin, which gradually wears it away. On this principle, substances are sometimes made use of which cannot dissolve, such as glass levigated, fish-bones, egg-shells in fine powder, &c. But if we reflect, that these substances remain real motts in the eye, exciting pain and inflammation, we shall surely reject them, and keep to such things only, as, when they have done their business, dissolve in the eye, and thus act a two-fold part, first of destroying the opake skin, and next of healing any remaining sores.

An obstruction from inflammation, or other cause, may happen in the passage by which the tears pass from the eye to the nose, and will occasion what is called a weeping nose. In this case, Vegetius (e) advises to examine the inner corner of the eye affected, and having found one of the small holes which receive the tears, to introduce into it a small pipe, and blow a mouthful of wine through this into the passage, thereby to clear it of any impacted or obstructing matter. If digested matter collects in the bag which receives the tears in their passage to the eye, the bag should be opened, and the passage into the nose cleared with a small probe or silver wire, and the bag then be permitted to heal. If the bone is foul, every person who would do justice to himself and to his horse, should consult a surgeon experienced in operations, and not truit a matter of this delicacy to himself or a farrier.

A total blindness is often brought on by a cataract, which is a disease of the crystalline hu-

(e) *Lib. II. c. xxi.*

mour, rendering it so opaque that the rays of light, which in it's natural transparent state were transmitted to the back of the eye, become intercepted. But as great dexterity is necessary in couching, I would here again recommend the hand of a skilful surgeon; as well as to dilate the iris, or that substance which contracts and dilates, in proportion to the quantity of light, thereby to protect the back part of the eye from being hurt by too great a glare of light. These being distempers in the internal part of the eye, very little can be done by external applications, unless it be by correcting the general habit of the body. As millipedes are observed to conduce much towards clearing the sight in men, when the imperfection arises from an internal weakness, so the use of them may be recommended here, at least, as a thing that can do no hurt; which is saying not a little of a medicine.

S E C T. VII.

Of Disorders in the Nose.

THE *Glanders* is one of the Diseases most fatal to horses, because it has hitherto been found to be incurable; and what renders it still more to be feared is, that it is contagious; and that other chronical distempers, as those of the lungs, and the farcy, either bring it on, or end with it.

It is a chronical disease, in which horses may continue long to appearance in good health, discharging, sometimes from one, sometimes from both nostrils, a matter which in the beginning is slimy, but becomes afterwards thicker and white, then clotted and ropey, afterwards of a yellowish

or

or greenish colour, and at last is reddish, and not uncommonly mixed with blood. The glands under the lower jaw, sometimes one, and sometimes more of them, are inflamed, painful, and adhere to the jaw-bone on the side on which the nose runs. If there is a discharge from both nostrils, the glands are thus swelled on both sides. The discharge sometimes ceases on one side, and begins on the other; and then the glands on the side where the discharge ceases are partly dissolved; and on the side where it begins they become swelled, hard, painful, and adhering. When the disease has continued long, the matter discharged becomes so very sharp, that it corrodes the nose from which it flows, in time creates ulcers, and even penetrates into the bones, which, especially in the nose, are of so cellular a nature, that they are easily pervaded by it. The smell then becomes very foetid, and the creature loses his strength and good looks. He grows feeble, and so hideous to behold when ready to die of this lingering disorder, that humanity prompts us to cut short his miserable days by death.

It is but of late that some hopes of surmounting this disease have been entertained. I shall here lay before the reader a short account of the attempts made for this purpose.

In the year 1749, M. de la Fosse, Farrier to the King of France, presented to the Royal Academy of Sciences a *Mémoire* (a), in which, after having examined by dissection the carcase of several glandered horses, and made a strict search into the state of their *viscera*, for ten years running, during which he was assisted by expert anatomists appointed for that purpose by the academy, he

(a) *Traité sur le Siège de la Morve.*

asserts

asserts this disease to be altogether local ; and that the true seat of it is in the *pituitary membrane*, which lines the partition along the inside of the nose, the *maxillary sinuses* or cavities of the cheek-bones on each side of the nose, and the *frontal sinuses*, or cavities above the orbits of the eyes ; that the liver, lungs, and other viscera of glandered horses are in general perfectly sound, and consequently that the seat of this disorder is not in those parts, as most authors have thought : “ for how, says he, could such horses retain their appetite, good appearance, sleek and shining coat, with all other signs of health for many years together, as glandered horses are frequently known to do, with bowels so distempered ? ” But on a nice examination of the heads of the dissected horses here spoken of, he found the above-mentioned cavities more or less filled with a viscous slimy matter, the membrane which lines both these and the nostrils inflamed, thickened, and corroded with ulcers, which in some cases had eaten into the bones, and the glands under the tongue were hard and choaked up.

In farther confirmation of his opinion, that the glanders is purely a local disorder, he undertook to bring on the same symptoms in a horse perfectly sound ; and succeeded therein, by syringing into the nostrils a corrosive liquor calculated to inflame the pituitary membrane. The horses on which he tried this experiment became glandered, that is, they had both a discharge from the nose, and their glands were swelled, either on one side or on both, according as the injection was thrown up into one or both nostrils. He adds, that repeated experience had taught him, that the glanders is often occasioned by blows on the horse's nose.

M. de la Fosse remarks, and the observation is really curious, that the sublingual glands, or the kernels situated under the jaw-bone, which are always swelled in this distemper, do not discharge their lymph into the mouth, as in man, but into the nostrils; and that he constantly found their obstruction agreed with the discharge.

The method of cure proposed by M. de la Fosse was agreeable to this system. He gave no internal medicine, and had only in view to cure the fault in the pituitary membrane, by injections fitted for that purpose; and in order to make an opening when necessary, he did not scruple to penetrate into the frontal and maxillary sinuses by means of a trepan, with which he made openings into the sinuses, one in the upper part of each sinus, and one in the lower part, to give a freer vent to the matter discharged, as well as to the ingredients thrown in; and by several experiments of this kind, made in the presence of the persons appointed by the Academy, he shewed that these openings were neither mortal nor dangerous.

The cure of the milder kinds of glanders may first be attempted by injections and fumigations. Thus, if a horse, after having taken cold, should discharge for a fortnight or three weeks running, a limpid fluid, or whitish matter, from one or both nostrils, and the glands under the jaw continue to swell and harden, rather than diminish, there is danger of this illness degenerating into a true glanders. To prevent this, after first bleeding, and treating him as before directed for a cold, let an emollient injection, composed of a decoction of linseed, marsh-mallows, elder flowers, chamomile flowers, and honey of roses, or such like, be thrown up as far as possible with a strong syringe, and repeated

peated thrice a day. If the running does not lessen, or is not removed in a fortnight, by the use of this injection, a restraining one may then be given, made with tincture of roses and lime-water, and the nostrils fumigated with powdered frankincense, mastich, amber, and cinnabar, burnt on a hot iron, and the fume conveyed through a tube into the nostrils.

This method has been found successful when used in time; but the methods of cure depend on the stubbornness of the disorder, and when it is inveterate, recourse must be had to the trepan.

M. de la Fosse performed the operation of the trepan on three horses, two of which had the running from one nostril only, and the third from both: he trepanned the two first on that side of the head which was affected, and the third on both sides of the head. The wound and perforation filled up with good flesh in twenty-six days, and the horses felt no inconvenience from the operation; though, after the experiment, they were put to death.

The injections first made use of should be of a deterfive nature, such as, a decoction of birthwort, gentian, and centaury, to a quart of which it will be right to add two ounces of *Ægyptiacum*, and tincture of myrrh dissolved in honey of roses, for otherwise this last will not mix with water; and when the discharge abates, and it's colour alters to a thick white matter, the injection may be changed for barley-water, honey of roses, and tincture of myrrh: and finally, to dry up the humidities, and restore the tone of the relaxed glands, Bates's alum-water, or a solution of colcothar, vitriol, lapis medicamentosus, or such like, in lime-water, may be used, and will most probably complete the cure.

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The syringe used on this occasion should be large enough to contain half a pint of injection.

M. de la Fosse's above-related experiments would seem to prove that the Glanders is a merely local disease, situated in the head. And yet we find, upon as good authority, some other observations, which render it equally probable that it is a disease in the humours.

M. Malouin's office at the Court of France having naturally thrown in his way the examination of several horses, belonging to the Royal Stables, that were attacked with this disease, he resolved to pursue the interesting inquiry; and the following is the result of his experiments communicated to the Royal Academy of Sciences.

He began with opening the bodies of several glandered horses. The brain in all of them was found. The pituitary membrane was always red, thicker and looser than in its natural state, and more or less covered with a matter resembling that which ran from the nose. It was not equally affected in all: in some only a part of that membrane appeared to be diseased; in others, the whole was vitiated and ulcered. The *uvula*, or roof of the mouth, was most commonly affected; and it even appeared in many, that it was from this part chiefly that the matter flowed.

In almost all of them, the lungs were distempered, and more or less filled with tubercles and small abscesses full of matter resembling the glanderous discharge. The liver frequently had white spots upon it, especially on the convex side; and under these spots were almost constantly found abscesses like those in the lungs, and filled with the same kind of matter. Sometimes the mesentery, the kidneys, the pylorus, and the wind-pipe, were affected; but the œso-
phagus,

phagus, stomach, intestines, and spleen, very seldom partook of it.

The longer the disease had continued, the more these parts were affected. When it had been but of short duration, the pituitary membrane only was hurt; and the others were diseased in proportion to the time the disorder had lasted.

Thus informed, M. Malouin engaged M. Serrier, Farrier to the King of France's lesser stables, to obtain leave for him to treat the glandered horses in such manner as he should judge most proper. The request was granted; and the horse he first took in hand was examined by all the King's farriers, who agreed that he was glandered,—It was a grey horse, aged about ten years, glandered on the right side, and discharging a very foetid matter, which had ulcerated in the nose.

The following is M. Malouin's own account of his proceedings, as delivered to the Royal Academy (a).

"I advised, that the horse should take once a day of my *Æthiops Antimonial* (b), and once a day of *Periwinkle* (c); to give him to drink, in his water, leavened paste, instead of the meal which is commonly used; to syringe his nose with a decoction of birthwort (d), and afterwards

(a) *Histoire de l'Academie Royale des Sciences, pour l'an 1750.* See also *La Chymie Medicinale de M. Malouin, Tom. II.* p. 169.

(b) To make this medicine, Take crude Antimony and Quicksilver, of each half an ounce, and Flowers of Sulphur two drams; rub them together in a marble mortar till the quicksilver disappears.

(c) *Peruinca angustifolia*, flore aut purpureo, aut albo, aut cæruleo; the *Clematis Daphnoides* of the antients. *Vinca-pervinca Officinarum*.

(d) *Aristolochia longa vera*.

with

with a vulnerary water ; to apply to the swelled glands the emplastrum diachylon with the gums, with a digestive ointment and cantharides mixed together ; and to purge him every eighth day. I likewise advised that he should be taken out every day, and walked with a longe as much as could be, in the sun, and in dry weather ; and to keep constantly rubbing him whilst in the stable.

“ This course was begun on the sixth of June 1759. The farrier gave him twice a day the periwinkle shred among his bran ; he was purged every week ; the plaister and digestive were applied to the gland : he gave up, from the beginning, syringing the vulnerary decoction into his nose, because, in order to do that, it was necessary each time to put him between the pillars : but he determined to make three openings with the trepan on the affected side, and passed through each hole a seton, the ends of which came out at the nose, and by which a great deal of stinking matter was discharged. The vulnerary decoction was daily injected into the two upper holes ; and when they were closed up, and there ceased to be a discharge from the nose, spirit of vitriol was injected, to dry it up perfectly, said the farrier.

“ With regard to the gland, it lessened and swelled at times, as is usual in such cases ; and as the plaister had no sensible effect on it, the farrier divided the skin over it, in order to lay upon the gland a mild caustic called *realgar*, which was kept on with compress and bandage. The gland was thus destroyed, and the sore was perfectly healed in five weeks, without any other dressing.

“ The horse having been treated in this manner during four months, appeared perfectly
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found, and about the beginning of October was returned to his former diet.

“ By the beginning of the ensuing year, he had recovered his good looks, the scars of his wounds scarce appeared, and no signs of the glanders remained. I was of opinion that they should not have ceased purging him all at once, but rather have left it off by degrees. Being a saddle-horse, he was returned to his usual exercise, which he bore very well for three months more, and would probably have done so much longer, had it not been thought for the good of the service to kill him, in order that, by opening his body, the effects of the cure might be seen. When opened, all the parts appeared sound, excepting that the pituitary membrane on the diseased side seemed a little swelled, and covered with the purulent matter of the glanders; which shewed that the purging should have been continued. Though this matter may probably have been separated constantly, yet it was not in sufficient quantity to cause a sensible discharge; a circumstance which ought to teach us, not to think that a glandered horse is perfectly cured when the discharge ceases.

“ The second horse that was put under cure was a bay, thirteen years old, easily purged, and naturally a great eater. He was short-breathed, coughed sometimes, worked much in the flanks, was exceeding lean and weak, and a white but very stinking matter ran from his nose.

“ On the first of March, 1760, he began his course. He took daily my antimonial *Æthiops*, and periwinkle; he was purged every eighth day in the beginning of the cure, but afterwards at longer intervals. He was not trepanned, nor was any injection thrown up his nose. The gland which

which was painful and fixed to the jaw, dispersed without a caustic or any other application. The success of this course was speedy. The matter ceased to flow; the horse breathed freely, without labouring in his loins, and he recovered his good looks. He was occasionally purged, after being returned to his oats and common diet; and at the end of six months he was put to his usual labour, as a coach-horse. — In July 1762, (the time when this account was given,) he remained in perfect health, being occasionally purged; and though he has the hardest task in the King's coach, that of carrying the postillion, he bears it well; and I have obtained an order for his being continued on, that we may see what will become of him.

“ The third horse was in the last stage of the glanders. The very bones on the right side of his head were swelled, the glands were swelled, and he discharged from one side a very stinking reddish matter frequently streaked with blood. The nose had a cancerous appearance, and even whilst under cure he was seized with the farcy.

“ Three openings were made with the trepan in 1760, and the vulnerary decoction was injected into the sinuses. The periwinkle and birthwort in powder were given to him, with the antimonial æthiops, and he was purged as before directed.

“ The farcy soon disappeared by the use of these medicines; but the glanders kept it's hold, and never was entirely got the better of: yet the discharge lessened, and became of a better quality. When the discharge lessened on the right side, it began on the left, and then continued on both, without however increasing in quantity. It at length diminished so as not to appear for

some days, and towards the close was become white, without the bad smell. The gland on the right side was opened with a caustic, and a purulent matter, like soap-suds, was discharged from it. The gland on the left side subsided as the discharge from that side lessened, and till it ceased entirely. The swelling on the bone was reduced to it's natural state. The purging having been neglected for some time, a swelling arose in his left ham, but soon yielded to the purges that were then given, and the horse recovered his good look. However, notwithstanding these appearances, the glanders did not give way; and indeed, during the last year, it could scarcely be said to mend, though the horse had then been two years under this course; at the end of which time he was killed, in order to examine the condition the parts were in.

“ The head appeared in it's natural state, except on the right side, where the sinuses were still bedewed with the matter discharged; and the tuberosity of the cheek-bone was penetrated. Part of the gland remained adhering to the jaw-bone. The right lobe of the lungs was internally full of tubercles, and externally there appeared many spots of blemish. There was a small abscess in the spleen. The rest of the body was perfectly sound.

“ M. Servier continues to treat glandered horses, with various success, in nearly the same manner, which consists in giving to each of them every morning from half an ounce to an ounce and a half of my antimonial æthiops, and every evening a handful of periwinkle shred among his bran. Great care should be taken to keep their nostrils clean, that they may not swallow the purulent matter. For this purpose, wine may be syringed up the nose. They cannot be rubbed

down

down too often. They should be carried out into the sun-shine every fair day; and the stable and litter should be kept dry. Though purges often disagree with horses, yet it is indispensibly necessary to continue using them here."

We are informed in the before-quoted History of the Academy of Sciences, that notwithstanding these experiments seem to prove the glanders to be a disorder of the blood and other humours, yet M. de la Fosse the son presented a Memoir to the Academy of Sciences, in support of his father's opinion; and that, in consideration of the importance of this matter, the Academy appointed Commissaries to examine into it.

Four glandered horses were opened in their presence. The internal parts of all the four were perfectly sound, except some white spots on the liver of one; and these were only superficial. Not the smallest vestige of the disease was seen any-where, but in the frontal and maxillary sinuses, and in the gland under the lower jaw. The lungs especially appeared to be in their natural state.

"How, add the Editors of the foregoing accounts, shall we reconcile this difference of opinions? It can only be, by assigning two causes of the Glanders, properly so called; the first external, which acts immediately on the pituitary membrane; and the other occasioned by some preceding disease, which, causing a flow of acrid matter through the nose, irritates the pituitary membrane, and occasions an inflammation of it. Among the external causes may be reckoned blows, too sudden a cold, or too acrid a matter inspired or injected. And this kind of glanders may be treated with injections, fumigations, &c. — Strangles, disorders of the lungs, farcy, or many other diseases, may become the

cause of the second kind of glanders; and it appears evident, that any topical application would be fruitless whilst the original distemper remains, and that this must be cured at the same time that it's effects are carried off."

Horses are peculiarly subject to this disease, because, with them, whatever comes out of the wind-pipe must flow through the nose; the uvula falling so low in them, that the passage by the mouth is interrupted; and hence it follows, that almost every distemper of the lungs must be communicated to the pituitary membrane. Horses that are affected with the glanders from external causes, may long retain their good looks: but in the other cases, their appearance must be proportioned to the degree of the original disorder. If the first of these sorts of glanders continues long, the whole mass of blood may be affected, and thence produce internal diseases; and by that means internal remedies may become as necessary here as in the other case.

The very ingenious Dr. Bisset, in his *Medical Essays* (e), proves by several instances the efficacy of a seton under the jaw, in scrophulous inflammations of the eyes: and this confirms the propriety of opening the head or swelled glands in the glanders, because, by the discharge it makes, that may conduce much to the cure; and should therefore be one of the first things done.

M. Bourgelat, Inspector of the Veterinarian School at Lyons, who published his work so late as the year 1765, speaks thus of the Glanders (f). "That formidable disease, the Glanders, baffles every means hitherto tried to cure it. The openings made by the trepan; all the injections thrown in to clear the mucous mem-

(e) Page 119.

(f) *Matiere Medicale raisonnée*, &c. p. 135.

brane,

brane, and restore it's tone; all the internal medicines that have been given, such as mercury used in friction, or combined with antimony in the antimonial æthiops, periwinkle, repeated purgations, hemlock, &c. have not absolutely got the better of this deadly venom."

Horses, as well as men, are sometimes afflicted with a *Polypus*, which should be extirpated when it hurts respiration. The method of extracting it (*g*) is by a pair of *forceps* with a slit at their extremities for the better hold, which must be introduced into the nostril as far as possible, to make the more sure of it towards the roots; then twisting them a little from one side to the other, you must continue in that action, while you pull very gradually the body of the polypus. If it breaks, the extraction must be repeated as long as any part remains, unless it be attended with a violent hæmorrhage, which is an accident that sometimes follows upon the operation, and indeed seldom fails to happen when the excrescence is schirrous: however, the operator is not to be alarmed at the appearance of an immoderate effusion after the separation, for, generally speaking, the vessels collapse very soon again: but if they do not, dry lint, or lint dipt in some styptic will readily stop it.

After the extirpation, the only proper use of escharotic powders is to destroy the remainder of the polypus which cannot be taken away, and to which access cannot be had: and the escharotics may be better conveyed to the part by a long tent, than by any other way.

(*g*). *Sharpe's Surgery, ch. xxxiii.*

S E C T. VIII.

Of the Diseases of the Mouth and Throat.

VEGETIUS observes (a), that when horses are pained in their gums and teeth, it is known by the following signs: A great deal of saliva flows from the horse's mouth, he will swallow his corn entire, and grows lean. Here, the mouth should be examined, and if any defect appears, it should be remedied, according to the nature of the case. Excrescences, commonly called by the barbarous names of *lampas* and *barbs*, should be cut off, whether on the roof of the mouth or about the tongue. Frequently too there are on the inside of the lips and palate little swellings, or bladders, called *giggs*: these are cured by opening them with a knife or lancet, and washing them with vinegar; but if they spread into ulcers with white specks, the best method will be to touch them with a small flat cautery moderately hot, till they cease spreading; and when the sloughs are cast off, which nature will effect, the sore may be dressed with a mixture of burnt alum and honey, one part of the former, and two of the latter. When the gums appear loose and spongy, Vegetius advises rubbing them for a long while with powder of the bark of pomegranate and honey. This may also have a good effect when little ulcers are seen on the gums or tongue; as may likewise alum, if they do not give way to the former application. Rotten teeth, or such as wound or hurt the horse, should be either pulled out, or filed down.

(a) *Lib. II. c. xxxii.*

The chief disorder in these parts is the Strangles, or what is analogous to a quinsy or inflammation of the tonsils in man; and, like it, is attended with fever, heat, and foulness in the mouth, a cough, an inclination to drink without being able to swallow, or to swallow but little, a loss of appetite, and, from the same cause, an inability to eat. The swelling generally is internal; but sometimes it appears externally, between the lower jaw-bones.

If this disorder is observed soon after the horse is seized with it, endeavours should be used to carry it off by plentiful bleeding and a cooling regimen; but if it does not soon yield to this treatment, the intention must be to bring it to suppuration as speedily as possible, because of the creature's difficulty of taking sufficient nourishment. Some authors, amongst whom are the writers of the *Maison Rustique* (b), look on this disorder as so peculiar to young horses that they seldom escape it, and therefore treat it as a critical discharge, in whatever part of the body the inflammation happens. Vegetius (c) advises a mixture to be made of two pints of oil and one of wine, added to water in which Syrian figs and leeks have been boiled and bruised with a sufficient quantity of nitre, and some of this to be given frequently, because, by it's oily mucilaginous quality, it softens and lubricates the parts. He likewise advises, that the horse be fed with green food sprinkled with nitre; or rather, that he be kept at pasture, if the weather will admit of it, because, by his hanging his head, whatever matter flows from the diseased parts, will fall out either by the nose or mouth. He directs also, that, to quicken the cure, se-

(b) *Tom. I. p. 235.* (c) *Lib. II. c. xxvi, & c. xxviii.*
veral

veral stones be made red hot, and that pieces of them be repeatedly put into a vessel full of urine held under the horse's head; his mouth being kept open by a piece of stick, the better to receive the fume both by nose and mouth, and the head covered so as to confine the steam: and after this, that the mouth, gums, and whole head be washed with warm water, in which as much salt has been dissolved as it will suspend, and a due proportion of the sharpest vinegar; and he finishes the cure with giving daily a powder composed of the roots of wild cucumbers and nitre, to keep the body open.

This disease bears so near a resemblance to the Quincy, that I cannot do better here than quote some directions given in the last-named disorder by the most judicious Sir John Pringle. This learned Physician recommends the following remedy, which he has sometimes found useful (*d*).
 " Let a piece of thick flannel, moistened with
 " two parts of common sweet oil, and one part
 " of spirit of hartshorn, be applied to the
 " throat, and renewed once in four or five
 " hours. By this means the neck, and some-
 " times the whole body, is put into a sweat,
 " which, after bleeding, either carries off or
 " lessens the inflammation. The *formula* is new,
 " but not the intention; for the antients ap-
 " plied warm oil with a sponge, and bags of
 " warm salt: and some later writers have re-
 " commended poultices made of the dung of
 " animals; which seems to be only a coarse and
 " offensive way of using the volatiles." I quote
 this passage with particular pleasure, because it
 confirms the rectitude of the practice of the Ro-
 mans, to rub the bodies of their distempered

(*d*) *Observations on the Diseases of the Army*, p. 142. 4th
 Edit.

horses so much without as they did; a practice which seems to be entirely neglected by the moderns.

Sir John proceeds thus (e): "I observed little benefit from common gargles; for at that time I did not inject them with a syringe, which I now constantly do. By this means the patient" (so will a horse) "brings away a great deal of tough phlegm, and generally finds some immediate relief; the glands of the fauces being cleared. My composition is, thirteen ounces of barley-water, or sage-tea, with two ounces of mel-rose, and one ounce of vinegar: sometimes I have added a spoonful of mustard for a greater stimulus. Even in the ulcerous sore throat, I lay the greatest stress of the cure upon gargling in this manner. I direct as many syringefuls to be injected, one after another, and as far into the throat, as the patient can bear; and to repeat the medicine three times a day."

If the swelling appears outwardly, a poultice will certainly be proper; as well as the addition of the warmer ingredients used for this purpose, such as flour of fenugreek seed, onions roasted or boiled, and added to flour and milk, with as much oil, or hog's lard, as shall keep it from growing dry. As soon as a fluctuation is felt in the external swelling, the tumour should be opened, and treated in the manner that will be directed when I come to speak of abscesses.

If the swelling breaks internally, the matter will be mostly discharged from the nose; so that to a person who has not attended to the preceding symptoms, the horse shall appear to have the glanders. If the suppuration has proceeded

(e) *Id. ibid.*

kindly, as the matter discharged has no great degree of acrimony, nothing need be feared from it. The nose should however be kept clean by mild injections, and others of a more detergent nature should be syringed into the mouth. The infusion of sage, honey, and mustard, as recommended by Sir John Pringle, becomes here highly proper: and as borax is found to be very effectual in clearing the mouth and gullet in children of that troublesome complaint the Thrush, it might probably be added here to great advantage. If the discharge becomes sharp, foetid, or ill-conditioned, then the use of the Jesuits bark, with warm aromatics, such as chamomile flowers, snake-root, &c. become necessary, together with keeping the parts warm.

Mr. Osmer (*f*) is clear that the strangles is only a critical swelling, and therefore should be brought to suppuration as soon as possible.

Farriers seem to have delighted in calling disorders by names which have no sort of affinity to either the complaint itself, or the part affected by it. Such as *lampas* and *barbs*, before noticed, and *Vives*, or *Ives*, a disease next to be treated of, chiefly on account of the propinquity of the part affected by it to the seat of the strangles: for as the strangles answers to an inflammation of the tonsils in men, so the *vives* is an inflammation or obstruction of the parotid glands, which often takes it's rise from a horse's being permitted to drink very cold water when he is hot, or suffering him to catch cold.

The symptoms of it are, that the horse loses at once his appetite, droops his head, his ears are cold, his mouth is hot and dry, he seems melancholy, rolls himself, lies down and rises

often, and twists himself about exceedingly, on account of the pains in his glands, and the gripings in his belly, which are accompanied with a retention of urine.

When this disorder happens to a young horse, it is deemed a critical discharge, the same as the strangles is thought to be; and the opinion therefore is, that it should be encouraged to come to suppuration, lest the humour fall on some other part. This, however, need not be a general rule; for if it arises from any external cause, such as the before-mentioned, bleeding, glysters, and a cooling diet, should be ordered. The embrocation with oil and spirit of hartshorn should be employed here, covering the neck with a lamb's skin, to keep it quite warm. If the swelling does not speedily give way to such applications, the intention should be changed to that of bringing on a suppuration; and poultices should be applied for that purpose. The method which some have proposed, of bruising the tumour, is cruel and painful, and may be attended with bad consequences: nor is the use of mercurials to be much more relied on; and at all events they certainly should not be employed at all while the tumour is in an inflammatory state. If the tumour is so large as to obstruct the horse's swallowing, or otherwise inconvenience him to any great degree, the best way is to cut it out.

The ears too may be affected with inflammations, which should be treated in a manner similar to the above directions; and in case of suppuration in the internal part of the ear, the matter should be discharged, and the ear kept clean, by throwing in a mixture of milk and honey at first, and afterwards a decoction of birthwort, plantain,

plantain, or such herbs, with honey, in order to cure.

S E C T. IX.

Of the Pleurisy, and Inflammation of the Lungs.

MR. Gibson pretends to describe the several symptoms which distinguish these diseases from one another: but at least as good an authority, Sir John Pringle, declares, that "since he had read the Dissertations and Remarks of those celebrated authors de Haller and Morgagni relating to this subject, he was convinced, that we ought to consider these two distempers as one; in which the lungs are always inflamed, and often without the pleura; but the pleura never without the lungs." The symptoms mentioned by Mr. Gibson can therefore be taken only as to a greater or less degree of fever and inflammation.

In these disorders, the fever rises suddenly to a great height, the breathing is difficult, attended with a cough, the horse shews great uneasiness, and shifts from place to place; in the beginning, he often strives to lie down, but starts up immediately. While the inflammation is moderate, a ropy slime runs out at the mouth, and a reddish or yellowish water gleans at the nose, sticking like glue to the inside of the nostrils. When the inflammation is great, the horse's ears are burning hot, his mouth is parched and dry, his pulse is hard and quick, and his flanks heave violently. Though, in the beginning, he makes many motions to lie down, yet afterwards he runs back as far as his halter will permit, and offers not in the least to change his posture, but stands
panting

panting with short stops, and a disposition to cough, till he has relief, or drops down. Mr. Gibbon makes the criterion of this distemper to be, the horse's frequently turning his head towards the affected side, which, says he, has caused many to mistake a pleuritic disorder for the gripes, this sign being common to both; though with this difference, that in the gripes the horse frequently lies down and rolls; and when they are violent, he will also have convulsive twitches, his eyes being turned up, and his limbs stretched out, as if he was dying; his ears and feet sometimes hot, and sometimes as cold as ice; he falls into profuse sweats, and then into cold damps; strives often to stale and dung, but with great pain and difficulty; which symptoms generally continue till he has some relief.

The cure of this disorder must begin with large and repeated bleedings. A strong horse may lose three quarts of blood, and if he is not relieved in twelve hours, he should lose two quarts more. Bleeding (a) in smaller quantities should be continued till the symptoms abate, or weakness forbids it.

On this head Sir John Pringle most judiciously remarks, that "though we reject the critical days, we must still with the ancients observe certain periods of the inflammatory pleurisy, distinguishable both by the symptoms, and the indication of cure:—for certain it is, that if the *sputum*" [or in horses a digested discharge by the nose] "appears, we are to consider it as a means of cure, and therefore not to divert it by continued bleeding or other evacuations. Bleeding may be continued freely," says he, "for the first three or four days of the distemper;

(a) *Observations on the Diseases of the Army*, p. 145.

" but

“ but if in that time the spitting” [here, running at the nose] “ begins, the bleeding must either be
 “ wholly omitted, or so moderated, as to relieve
 “ the breast without impairing the strength, or
 “ checking the expectoration.”

In horses, we are deprived of one great means of curing this distemper, which Sir John seems chiefly to rely on, namely, blistering: but I think it might be renewed in this case, in the manner that Vegetius proposes for another complaint, viz. by adding cantharides to strong sinapisms. Might not the side of the horse be shaved, and a quantity of the Spanish flies in powder be spread on the sinapism, and applied to the part affected? In order to induce gentlemen to try this practice, I shall here subjoin what Sir John Pringle adds (*b*) concerning the effects of blisters. “ Blisters not only shorten
 “ the cure, but prevent the loss of a great deal
 “ of blood. A pleurisy taken in the beginning,
 “ will often be cured by one large bleeding, and
 “ a blister laid on the side affected. The objection to this practice is founded on the stimulating quality of the epispastic: but the
 “ relief is so certain, that theory ought only to
 “ be employed in accounting for the resolution
 “ of an internal spasm, or obstruction, by such a stimulus upon the skin.—The experience I have
 “ had induces me to apply the epispastic in the
 “ beginning of the disorder: for in treating great
 “ numbers, I found no inconvenience from using
 “ the blister immediately after the first bleeding;
 “ but, on the contrary, a more sudden and certain
 “ relief.—Though the symptom may vanish upon
 “ blistering, it will be more secure to bleed
 “ again; for if the lungs are much inflamed,

(*b*) *Ibid.* p. 146.

"the cure cannot be so speedy; for though the
"first bleeding and blistering should give ease,
"yet repetitions of both will be needful. Some-
"times the stitch returns, and fixes on the other
"side: but this being treated as the first, will
"also give way."

The horse should be kept on a cool diluting regimen, giving him plenty to drink, rather often than much at a time. In his drink, figs, raisins, barley, liquorice, and such mild mucilaginous substances, should be boiled; also nitre, to the quantity of two ounces; and oils dissolved in honey and then mixed with water, should be given; as likewise, sperma-ceti dissolved in the yolk of an egg. When he begins to run at the nose, warmer things may be given to promote the expectoration; such as squills, or their oxymel, to the quantity of three or four ounces, or a solution of gum ammoniac. It has been said, that the rattle-snake root is peculiarly useful in this intention: but it has of late lost much of its reputation in the opinion of physicians. "I have likewise, says Sir John Pringle (c), observed some good effects from making the patient [the same may be applied to a horse] breathe over the steam of hot water,—which is rendered more beneficial when the phlegm is viscid, as well as more grateful, by adding a small proportion of vinegar." A mild glyster should be given once a day; and if the creature is costive, it may be quickened by the addition of three or four ounces of purging salt, or as much syrop of buckthorn.

As pleuritic disorders are apt to leave a taint on the lungs, great care should be taken that the horse have a light and easy diet for two or

(c) *Ibid.* p. 148.

three weeks, and that he be brought to his exercise gradually in an open air and fair weather; and as he recovers his strength, his body should be kept gently open.

If the inflammation terminates in a gangrene or mortification, death ensues; or if it suppurates, and the matter is confined, it soon brings death; or if it is ejected by the wind-pipe, the abscess scarcely ever cures, and the acrid taint of the purulent matter discharged by coughing is apt to infect sound horses. A prudent man will therefore not risk an uncertain cure with the danger of his other horses.

Vegetius (*d*), in disorders of the lungs, probably in a consumptive state, recommends three eggs mixed with goat's milk and a spoonful of honey, with other pectorals. He also directs (*e*) half a pint of raisin wine and three ounces of oil, with a raw egg, to be given for three successive days, having added to them bean-flour and fennugreek seeds, elecampane, and comfrey. This mixture to be given to the horse fasting.

Likewise, with the same view of assisting the lungs, the *Maison Rustique* (*f*) recommends as an easy and excellent remedy, to put a dozen of eggs into so much strong vinegar as shall cover them to the depth of about half an inch, and when the shells are become soft by steeping in the vinegar, to make the horse swallow them all, whole, one by one, with a little of the vinegar, or, if it can be done, all the vinegar in which they were laid; then to walk him about gently for two hours, and afterwards give him scalded bran, but neither oats nor hay. Repeat this remedy, if necessary.

(*d*) *Lib. III. c. xlv.*

(*e*) *Lib. IV. c. viii.*

(*f*) *Tome I, Part. I, Liv. III, chap. I. p. 257.*

An inflammation sometimes seizes the muscles or their membranes between the ribs. This is known by a stiffness of the body, an inaptitude of motion in the shoulder and fore-leg of the side affected, attended with a shrinking when the part is handled, and a cough.

The means of cure are the same as in the former case; only that as the seat of this false pleurisy is external, it may be more readily removed by external softening applications. Poul-tices here may be peculiarly useful, as likewise may oily embrocations. Indeed, the oil and spirit of hartshorn, before directed, might be rubbed all over the breast in the true pleurisy, as well as in this false one. This disorder frequently terminates in a suppuration, and the matter sometimes insinuates itself among the muscles of the shoulder or fore-leg, in which case an immediate outlet should be given to it.

S E C T. X.

Of the Asthma and Broken-Wind.

AN Asthma is constantly attended with a cough, and may easily be distinguished from a consumption by the quality of the matter that is brought up, which, in an asthma, is not of the purulent and foetid nature that is in a consumption, when the flesh and strength decay. An asthmatic horse has a difficulty of breathing, which can be easily distinguished from that shortness of breath which arises from inflammation, by the absence of fever, heat, &c. The cough is sometimes dry and husky, sometimes moist, throwing out by the nose and mouth quantities of tough white phlegm, especially

cially after any action that has loosened the phlegm adhering to the fauces or wind-pipe, such as drinking, eating, or exercise; which, creating a discharge in the diseased glands, loosens the impacted or adhering matter. This discharge gives a temporary relief; and though a horse should be at the beginning of any exercise so short-breathed as scarcely to be able to stir, yet the exercise continuing to keep the wind-pipe clear of this tough matter, he may afterwards perform beyond expectation. As in man, so in horses, we often see that a true asthmatic cough does not greatly impair the flesh, nor the strength, if the exercise is gentle.

This disease is very hard to cure, and scarce ever curable where it has continued for some time. If the horse is full of flesh, he should be bled, but only in a moderate degree, because bleeding here is but a palliative when the disorder attacks with more than common force. During the violence of a fit of an asthma, the horse should be treated with a cooling regimen, giving him plenty of mealy drinks with nitre, and keeping the body open, first with glysters, and then by internal medicines.

As a radical cure can scarcely be expected, all that can be done is to render the disorder as easy as possible. With this view, the use of gum ammoniac and assa-foetida, of squills, garlic, elecampane, flower of sulphur, and mercury, has long been practised. The quick-silver itself is here found more efficacious than any preparation of it. Balls of the following composition may be given: viz. Quick-silver half an ounce, fresh squills two drams, simple balsam of sulphur twenty drops; rub them together till the quick-silver entirely disappears; then add gum-ammoniac and assa-foetida, of each half an ounce, and
honey

honey enough to make them into a mass; to be given daily in such quantity as shall keep the belly open. A solution of gum ammoniac may be given in a decoction of garlic, or pine tops. These last may also be given with the corn. The antimonial æthiops is likewise here a good medicine; and a constant drain made by rowels may be of singular service. What will also tend greatly to keep this disorder under, is, early soiling in summer, with lucerne, or other succulent plants, while their juices are yet in a watery state, and more purgative than when concocted by the summer's heat, which likewise renders them more nourishing; and in the autumn, the salt-marshes afford no less relief, by their cooling and opening virtues.

M. Bourgelat says (a), that sulphur and lead, or sulphur and steel, operate with such certainty in an asthma, as not to leave room to wish for any thing better; the writers of the *Maison Rustique* (b) had before recommended the following preparation: Take packets of Spanish steel, make them red hot in a new crucible put into a smith's forge; then rub them with rolls of sulphur, which will make the steel melt like butter; after this, put them again into the forge, that the steel and brimstone may be thoroughly melted in the crucible: after this, pound the mass in a mortar, and sift it; there will remain a powder of steel, which is to be kept in a pot for use. Mix three pinches of this powder with the broken-winded horse's corn, wetting the oats so that the powder may stick to them, and continue this for a month.

M. Bourgelat's prescription (c) for a broken-winded horse runs thus: Take equal parts of

(a) *Matiere Médical raisonnée*, p. 134. (b) *Tome I. p. 252.*

(c) *Ubi supra; Formulae Medicinales*, p. 57.

filings of lead, and flour of brimstone, put them into a crucible layer upon layer, beginning with the brimstone, till the crucible is full; then place the crucible upon burning coals till it becomes red hot, and, to quicken the operation, set fire to the matter. Take it off the coals as soon as it ceases to smoke. Pound the black matter which remains in the crucible: give two drams of it every morning to the animal, fasting; and continue so to do for some time.

A horse's being broken-winded, seems rather a fault in the make and constitution, than a disorder brought on. Thus, broken-winded horses are generally narrow chested, so that the lungs have scarcely room to play. The lungs and pericardium are sometimes observed in such horses, to be larger in proportion to the cavity, than they are in a sound horse. This enlargement of the viscera is commonly attributed to their having been over-fed when young; but I am persuaded, that if these parts had been of a due conformation at first, this disproportion might not have taken place. Be that, however, as it may; this opinion leads to a rational method of cure, or at least, to the only thing that can be done towards a cure; which is, an abstemious cool diet, avoiding rich hay, and all other very nourishing plants. Keeping the horse on green food in the field is of great service; and the mixing of chopped straw with his hay, as is usually practised in this case, is perfectly right. This disease seldom affects horses to any degree before they have come to their full growth, when the cartilages at the ends of the ribs becoming stiffer, do not so easily give way to any strong or sudden expansion of the lungs.

Some horses are at times troubled with a dry cough, which impairs their health; and scarce admits

admits of any medicines, except cooling evacuations now and then, and a spare cooling diet; keeping them well rubbed down, in order that the perspiration may be free; because an interruption of this is in all creatures apt chiefly to affect the lungs. For this purpose, antimony, or the antimonial æthiops, brimstone, elecampane roots, and tops of broom, are proper.

The young of quadrupeds, as well as those of the human species, are troubled with a cough when they are cutting their teeth; but it goes off as the teeth are cut. However, if it should be very troublesome, bleeding and a cooling regimen may keep it under; and if the gums are much inflamed, they may be cut wherever the prominence points out that a tooth is ready to pierce. Young horses which are troubled with worms sometimes cough: but this ceases when the worms are carried off.

It is observed of broken-winded horses, that they draw in their breath slowly, their flanks filling up gradually and with a seeming difficulty, because the lungs do not yield easily to the air drawn in; and that their flanks fall suddenly, and their breath bursts forth with violence; insomuch that a man in the dark, by holding his hand on a horse's mouth and nose, may easily discover if he is broken-winded. Such horses are also observed to lose their delicacy in the flavour of their food, so as to eat even their litter; and to be very drouthy.

To be certain that a horse is broken-winded (*d*), squeeze his throat, near the channel, when his flanks beat, and make him cough; if the sound of the cough is dry, 'tis a bad sign, and if it is dry and frequent, still worse; whereas little need be

(*d*) *Maison Rustique*, Tom. I. p. 251.

feared if it is attended with moisture. A horse that farts when he coughs is almost always broken-winded, and that sort of broken-wind is thought the most difficult to cure. Horses which have been broken-winded from their birth, or those in which it has been long neglected, are incurable. Neither can broken-winded horses that take in wind by the fundament, ever be cured.

In general, the great point in this disorder is, to keep the horse on a moderate diet, and give him moderate exercise; and it will be right to moisten his dry food, such as hay, corn, &c. with water, to prevent his drought, and consequent too plentiful drinking.

S E C T. XI.

Of the Colic, and Inflammation of the Bowels.

THE most frequent causes of colics in horses are, inflammation in the bowels of the abdomen, and the swallowing of too much cold water when heated. When the complaint arises from this last cause, Mr. Osmer (a) directs that an ounce of *Philonium Romanum* be given, and repeated if there be occasion.

When the colic proceeds from inflammation, it is constantly attended with an extraordinary quickness of the pulse; the horse lies down often and suddenly rises up again, he strikes his belly with his hind feet and stamps with his fore-feet. When the pain is very violent, he may have convulsive twitches in his eyes, and sometimes

(a) P. 156.

stretch out his limbs as if he was dying; he falls into cold damps and profuse sweats, his ears and feet being alternately hot and cold. If the colic is attended with a stoppage of urine, he will often strive to stale, turn his head to his flanks, and frequently turn on his back and roll about. If the inflammation proceeds towards a mortification, a little dung is sometimes discharged with a foetid blackish ichor.

This inflammatory colic may take it's rise from any cause which excites an inflammation, and should be treated as such, with evacuations and a cooling regimen. The cure must begin with speedy and plentiful bleeding. The strait-gut should then be emptied of all the hard dung that a well-anointed hand can take away. This will make room for a sharp stimulating glyster, in which four ounces of some purging salt, and as much oil, may be dissolved; and it should be repeated every four or six hours, till the horse has a natural stool. If the pulse continues hard and quick, with heat, a dry mouth, and thirst, the bleeding should be occasionally repeated. Plenty of mild drink, such as bran and water, should be given; and instead of administering at once such a quantity of a purgative medicine as might, by irritating, increase the disorder, six or eight ounces of some purging salt may be dissolved in a sufficient quantity of water, and half an ounce of the salt so dissolved be given every half hour, till the horse has a stool.—The Romans always anointed the belly and back of horses that were ill of any complaint in the bowels, with a mixture of oil and warm ingredients. The oil and spirit of hartshorn before mentioned, may answer this purpose very properly; especially if it be continued till the creature begins to sweat, when he should be covered up very warm. In similar

similar disorders in the human body, Sir John Pringle lays very great stress on blisters applied to the part affected. "As I have oftener than once," says he (b), "known the patient relieved in his bowels, as soon as he felt the burning of his skin; and at the same time have stools by a purge or glyster, which had not operated before; we have reason to believe that the blister acts as an antispasmodic, and not as an evacuant."

If, by the use of these means, a natural stool is produced, and the horse ceases to start, tumble, and gather up his legs, there is room to hope his recovery: but if the symptoms grow worse, and signs of a mortification appear, it is hardly to be expected that he should get the better of a disorder which has seized parts in themselves so thin, and in which it makes so rapid a progress. The Jesuit's bark being in many cases found a powerful antiseptic, some recommend here a strong decoction of it, with the addition of a quantity of wine equal to that of the decoction: but this, I doubt, is said more from theory than from any experience of it's good effects; though, indeed, no bad effect can attend it. Vegetius (c) advises that, in case a glyster cannot be conveniently given, long and hard *suppositories* be made of honey and salt, and kept constantly in the anus, in order to excite stools. When the belly is very much distended, he (d) recommends tapping, after the following manner. "About four fingers breadth under the horse's navel towards his yard, in the middle region of the belly, thrust in a lancet, so as to pierce through the peritoneum, or membrane which lines the inside of the

(b) *Observations on the Diseases of the Army*, p. 155.

(c) *Lib. I. c. xlii.*

(d) *Lib. I. c. xliii.*

belly,

belly," but with caution, lest the intestines be likewise hurt; and after the lancet is taken out, introduce into the incision a pipe bored through with many holes, by which the water may be discharged."—It would seem more adviseable to perform this operation with a trocar, as is now practised by surgeons in the dropsy, and to do it rather a little on one side, than in the middle of the belly, because the muscles there being more of a fleshy nature, will more easily heal, than when wounded in the middle, where they become tendonous.

After a free passage is obtained, it will be proper to give every night three or four grains of opium, and to continue it till there is no danger of a relapse: then the horse must have such food as shall be the least flatulent or irritating.

I beg leave here again to caution gentlemen against the many hot medicines commonly prescribed in this disorder, such as turpentine, oil of juniper, anise, pepper, &c. all which increase the disease by their greater stimulus, and therefore are now entirely laid aside in similar disorders in mankind.

S E C T. XII.

Of Worms and Bots.

HORSES, as well as men, are subject to two sorts of worms, the one round, resembling the earth-worm, and the other the ascarides, which lodge themselves chiefly in the strait-gut. The bots are a kind of large maggot, composed of circular rings, with little sharp prickly feet along the sides of their bellies, with which

which they fasten themselves to the lower orifice of the stomach, from the blood-vessels of which they draw their nourishment, and when many, create ulcers in it, and make such havock as quickly to destroy the horse. They adhere so strongly, that, even after the animal is dead, it requires a good pull to disengage them. The pain which they create occasions some degree of fever, the horse grows lean, and hide-bound. They sometimes give so much pain, as to bring on convulsions, especially in the eyes. Though the belly is not swelled as in the colic, yet the horses roll themselves about, throw themselves on their back, and put their head between their legs, to shew the place where the pain is. Vegetius observes (*a*), that if the strait-gut is carefully examined by the hand, the bots will be found adhering to it in clusters, that they stick so fast as not to be pulled away without much difficulty, and when brought out, stick to the fingers.

We are told in the *Maison Rustique* (*b*), that there is a fly which finds the means of insinuating itself into the fundament of horses, and of laying it's eggs there. As soon as it enters, the horse is thrown into a kind of madness, jumping, running, tossing his head, for a full quarter of an hour; but as these flies are only in the country, none but horses which are fed in the field are in danger of them.

M. de Réaumur's account of this insect, and of it's manner of introducing itself into the fundament of the horse, is so very curious, that I am confident my readers will readily pardon the length of the following quotation from that great and justly-admired Naturalist (*c*).

(*a*) Lib. I. c. lii. (*b*) Tom. I. p. 261.

(*c*) *Histoire des Insectes.*

“ Among the animals that are useful to man-
“ kind, the horse is certainly entitled to the first
“ rank ; and yet this animal, considerable as it
“ is, and contrived by it's figure and beautiful
“ proportion to afford us pleasure, was not given
“ to man only : there is a species of fly, whose
“ right in this creature may be looked upon as
“ still better founded than our's.

“ If the horse be useful to us, he is absolutely
“ necessary to this fly ; and the same Being that
“ formed the horse, formed also this fly, which
“ depends wholly on the horse for it's preservation
“ and continuance. The flies we are speaking
“ of, like those of the other species, receive their
“ first life and growth in the form of worms :
“ but these are worms which can be produced
“ and nourished only in the intestines of a horse.
“ It is there alone they can enjoy the proper tem-
“ perature of heat, and receive the nourishment
“ necessary for them.

“ Besides the long, and sometimes very long,
“ worms which have been observed in the bodies
“ of horses, there have been seen also in them
“ short ones.—All authors, both antient and
“ modern, who have treated of the diseases of
“ horses, have taken notice of these short worms ;
“ but M. Valisnieri is, I believe, the first who
“ has traced them to the last stage of their trans-
“ formation, and seen them change into a hairy
“ kind of fly, like the drone.

“ The flies from which these bots are produced
“ inhabit the country, and do not come near
“ houses, at least not near those of great towns ;
“ and therefore horses are never liable to have
“ these short worms in their bodies if they have
“ been kept within doors, especially in a town,
“ during the summer and autumn. It is in the
“ former of these seasons, and perhaps too in the
“ beginning

“ beginning of the latter, that the females of
 “ these flies apply themselves to the anus of
 “ horses, and endeavour to gain admittance, in
 “ order there to deposit their eggs, or perhaps
 “ their worms.

“ The precise instant of their entrance will
 “ scarce admit of an eye-witness, but by the
 “ meekest chance: yet M. Valisnieri says, that
 “ Dr. Gaspari had beheld this very uncommon
 “ sight.—The Doctor was one day looking at
 “ his mares in a field, and observed, that from
 “ being perfectly quiet, they of a sudden be-
 “ came very restless, and ran about in great agi-
 “ tation, prancing, plunging, and kicking, with
 “ violent motions of their tails. He concluded,
 “ that these extraordinary effects were produced
 “ by some fly buzzing about them, and endea-
 “ vouring to settle upon the anus of one of
 “ them; but the fly not being able to succeed,
 “ he observed it go off, with less noise than be-
 “ fore, towards a mare that was feeding at a
 “ distance from the rest; and now the fly taking
 “ a more effectual method to compass it's de-
 “ sign, passed under the tail of the mare, and so
 “ made it's way to the anus.

“ Here, at first, it occasioned only an itching,
 “ by which the intestine was protruded with an
 “ increased aperture of the anus; the fly taking
 “ advantage of this, penetrated farther, and
 “ lodged itself in the folds of the intestine; this
 “ done, it was in a situation proper for laying it's
 “ eggs. Soon after this, the mare became very
 “ violent, running about, prancing, and kick-
 “ ing, and throwing herself on the ground; in
 “ short, was not quiet, nor returned to feeding,
 “ till after a quarter of an hour.

“ The fly then, we see, can find means of de-
 “ positing it's eggs, or perhaps it's worms, in

“ the

“ the fundament of the horse; which once effected, it has done all that is necessary for them.

“ If these worms are not already hatched when first deposited in the horse, but are then only eggs, it will not belong before they are hatched, from the nutritive heat they there receive.

“ These worms soon make their way into the intestines of the horse; they occupy such parts of this region as are to them most convenient, and sometimes, as we shall soon see, penetrate even to the stomach. All the hazard they appear to be exposed to is, that of being carried away from the places they have fixed on by the excrement, which may seem likely to drive all before it. But nature has provided for all things; and when we shall have farther described these worms, it will be seen, that they are able to maintain their situation, and to remain in the body of the horse as long as they please.

“ There is a time when these worms are of themselves desirous to leave this their habitation; it being no longer convenient to them after the purposes of their growth are answered. Their transformation to a fly must be performed out of the horse's body; and accordingly, when the time of their transformation draws near, they approach towards the anus of the horse, and then leave him of their own accord, or with the excrement, with which they suffer themselves to be carried along.

“ The figure of these worms affords at first sight nothing remarkable, but they appear like many other worms of the class, that change into flies with two wings, and like the greatest part of the worms of that class, they
“ are

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“ are provided with a sort of scaly claws, with
 “ which they draw themselves forward.

“ A difference in colour may be observed be-
 “ tween those that are taken by force from the
 “ intestine of the horse, and those which come
 “ away of their own accord; some are greenish,
 “ some yellowish, and others nearly brown:
 “ these last are nearest to, and the greenish ones
 “ the farthest from, the time of their trans-
 “ ation.

“ If M. Valisnieri and myself have rightly
 “ observed the position of their claws, some of
 “ them differ from others in this respect; but they
 “ are perfectly similar in every other particular,
 “ and change into flies so nearly alike, that I
 “ am convinced they are of the same kind and
 “ origin.

“ However this may be, the worms we now
 “ are speaking of have two unequal claws; and
 “ since I have been acquainted with the nature
 “ and use of those claws, it has seemed to me
 “ easy to conceive how they may remain in the
 “ intestines of a horse, in opposition to all efforts
 “ of the excrements to force them out. One
 “ that I was handling and examining fastened
 “ upon my finger in such a manner that I found
 “ great difficulty to get it off. These claws are
 “ a sort of anchors, differently indeed disposed
 “ from the wings of common anchors, but con-
 “ trived to produce the same effect.

“ Besides these two claws, nature hath given
 “ to each of these worms a very great number
 “ of triangular spikes, or bristles, amply suffi-
 “ cient to arm against the coats of the intestines,
 “ and to resist the force employed to drive them
 “ towards the anus, provided the head be di-
 “ rected towards the stomach of the horse.

“ It

" It will undoubtedly be asked, whether these
" worms are not dangerous to horses?—The
" mares which afforded me, for several years,
" those on which I made my observations, did
" not appear to be less in health than those which
" had none: but it may sometimes happen, that
" they are in so great a quantity in the body of
" the horse, as to prove fatal to him. M. Val-
" lislneri supposes these worms to have been the
" cause of an epidemical disease which destroyed
" a great many horses about Verona and Mantua
" in the year 1713; and the observations com-
" municated to him by Dr. Gaspari sufficiently
" confirm his supposition.

" This gentleman, upon dissecting some horses
" that died of this distemper, found in their
" stomachs a surprizing quantity of short
" worms; to give us some idea of which, he
" compares them to the kernels of a pomega-
" nate opened: each of these worms, by gnawing
" on the coat of the stomach, had made for itself a
" kind of cell therein, and each of these ca-
" vities would easily contain a grain of Indian
" wheat. One may readily imagine to how
" wretched a condition the stomach must be re-
" duced by this means: the outer membranes
" were inflamed, and the inner ones ulcerated,
" and corrupted. A very small quantity of
" these worms were found in the small intestines,
" and only a few in the larger, to which last
" they were found affixed, but had corroded
" them.

" Is it, perhaps, only when these worms are
" in great numbers, and incommode each other
" in the intestines of the horse, that they make
" their way towards the stomach; and indeed a
" very few flies must be sufficient to overstock
" the inside of a horse, provided they should de-
" posit

“posit all their eggs, and these be animated;
 “M. Valisnieri having counted upwards of seven
 “hundred eggs in the body of one single fly.

“When one of these worms has quitted the
 “anus of the horse, it falls on the ground, and
 “immediately seeks out for some place of safety
 “to which it may retire, to prepare for the last
 “stage of it’s transformation, by which it is to
 “become a fly.—It’s skin now hardens and
 “thickens by degrees, and at length forms a so-
 “lid shell or cod, the shape of which scarcely dif-
 “fers from that of the worm. It is first of a
 “pale red colour, which changes into chesnut,
 “and at length, by the addition of gradual and
 “successive shades of brown, the shell is rendered
 “black. Before the worm passes into a
 “nymph, it is of the form of an oblong ball;
 “and it remains in this shape much longer than
 “worms of the flesh-fly kind. I have met
 “with some that have not shewn the smallest
 “traces of the legs, wings, and head of the
 “nymph, even at the end of five or six days;
 “and from thence I first learnt that these worms
 “do not become nymphs immediately upon
 “their first change, but that, in order to be-
 “come flies, they must undergo one change
 “more than caterpillars generally do to become
 “butterflies.”

Mr. Oîmer (*d*) rightly infers from M. de
 Reaumur’s foregoing account of this insect,
 first, that horses may occasionally die of spasms
 and convulsions when these bots, for that is
 the name which our farriers give to these short
 worms, lodge in the stomach and intestines,
 and corrode the same, instead of coming away
 by the anus; and secondly, that no medicines

ought to be esteemed a remedy for the bots, till we see them brought away dead by their effects; and therefore, that if they did not generally make their escape by some means unknown to us, horses would die much oftener than they do of these insects.

The cure which he (e) proposes is as follows: "Take of new milk one quart, honey half a pound; give the horse this in a morning: let him fast after it an hour and a half: then give him a pint of strong brine, more or less, according to the size and strength of the horse, and let him fast another hour. Repeat this three or four successive mornings." It destroys the worms, and leaves no appearance but of their skins, or shells, which are brought away with the excrement. Mr. Osmer adds, that this method will likewise kill all sorts of worms, Linnæus says, (f) that the bran of the flote fescue grass will cure horses troubled with the bots, if they are kept from drinking for some hours.

The *ascarides*, which are the other kind of worm I observed that horses are subject to, are discovered by their being often protruded with the dung, together with a yellowish-coloured matter, like sulphur; and the horse troubled with them often rubs his breech against walls or posts. A solution of sublimate thrown up by a glyster is here the proper cure.

Dissections have shewn M. Bourgelat, that worms occupy almost all parts of the body. (g) He has found them not only in the œsophagus, stomach, and intestines, but even in the arteries and veins, especially in the *vena porta*; as also in the urinary and bilious ducts. These parts, in asses, oxen, sheep, and goats,

(e) P. 184. (f) *Flora Suecica*, Art. 95.

(g) *Matière médicale raisonnée*, p. 129.

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are often full of leeches, flugs, or the *fasciola hepatica* of Linnæus. No part of the body escapes one kind or other of them.

M. Bourgelat observes, (e) that of all the purging medicines which carry off the worms and their eggs, or seed, bitters are the best, not only as being detested by them, but also as restoring the strength and function of the bowels, and preventing their being bred again. Oils, which are found to lock up their pores, and thereby suffocate them, are also recommended here. In these opinions he is supported by Vegetius (f), who advises to boil wormwood, cresses, and coriander seed, in a quart of oil, and to give half a pint of this, mixed with luke-warm water, in the morning, fasting, for several days together. He advises to add nitre to it, or to give it in the horse's food: and after the strait-gut is emptied of hard fæces, he directs a similar oily glyster to be thrown up, to destroy the ascarides lodged there.

M. Bourgelat rightly advises (g), that the use of these medicides be followed by that of calomel, two drams, and as much jalap, in a ball with honey; because this, by it's stimulus, may break the cohesion of the worms to the parts, and expel them. He likewise thinks (b), that sheep, especially, should frequently have salt given them for these worms, which are in the vessels about the liver.

After the appearance of worms has ceased, it will be proper to continue the use of bitters every morning for some time, in order, as was before observed, to recover the tone of the bowels, and to prevent a return of these troublesome, though

(e) *Ibid.* p. 131.

(f) *Lib. I. c. xliii.*

(g) *Matiere medicale*, p. 131.

(b) *Ibid.* p. 132.

not always dangerous, enemies To this end, take wormwood and chamomile-flowers, of each two handfuls; gentian root and Jesuits bark, of each two ounces; make a decoction of them in water till there remains two quarts, and give half a pint of this three times a day. Cinnabar and filings of iron, made into balls, may also be given for the same purpose, before the decoction.

S E C T. XIII.

Of Purging, and of Molten Grease.

PURGING, in horses, as in men, is sometimes a salutary crisis, and in that case little need be done. We may guess it to be such when a healthy horse is seized with a purging preceded by a slight fever, or some other cause which we may not be able to assign. All that is necessary here is, by a mild opening diet to encourage the discharge, if it continues only a few days.

When the purging continues with a considerable degree of fever, signs of pain, or griping, loss of appetite, and a discharge of the mucus of the bowels, it is time to think of a remedy. If the horse is in flesh and strength, we should begin with bleeding, and then give mild purging medicines to discharge any acrid matter which may have fallen upon the bowels. Modern practice has taught physicians, that this is by much the safest and most efficacious method even in the dysentery, as we find on every occasion inculcated by Sir John Pringle, and by the ingenious and observant Dr. Monro in his very useful

account of the diseases in military hospitals (i).
 “ The purgative,” says this last gentleman,
 “ that upon repeated trials we found to an-
 “ swer the best, was sal catharticum amarum
 “ with manna and oil, which operated without
 “ griping or disturbing the patient, procured a
 “ freer evacuation, and gave greater relief, than
 “ any other purgative medicine we tried. A
 “ great part of the cure depended on the fre-
 “ quent use of gentle purges in the beginning,
 “ to carry off the corrupted humours: the pur-
 “ gative was repeated every second, third, or
 “ fourth day, as the case required. It was sur-
 “ prising with how little loss of strength the
 “ sick bore the operations of these purges; and
 “ I observed that the patients, instead of being
 “ weakened, seemed stronger, and more brisk
 “ and lively, after the operation of each, from
 “ the relief it gave, by evacuating those putrid
 “ corrupted humours which made them perpe-
 “ tually sick and uneasy while they remained in
 “ the bowels.”—For horses, three ounces of this
 salt may be mixed with four ounces of oil, and
 as much manna; the whole dissolved in a pint
 of water, and repeated occasionally. In order
 to take off the pain, and alleviate the excoria-
 tion frequently occasioned in the strait-gut by
 the acrimony of the matter discharged, glysters
 of starch dissolved in milk, or mild oily mix-
 tures, should be frequently thrown up. It is
 likewise of great consequence that the animal
 have plenty of mild drink and food, which
 may as it were sheath the sharp humour dis-
 charged into the bowels, as well as line them
 against it's acrimony: such are, decoctions of
 farinacious feeds; and absorbents, such as

(i) P. 70.

chalk, and burnt hartshorn. If there are signs of much pain, from six to seven grains of opium may be given on the days free from purging; and in order to encourage the perspiration, a dram of camphire, mixed with two drams of nitre, may be made into a ball with honey, and given with the opiate. With this view, it will be highly necessary to rub the horses well, and to keep the stable in which they are sweet and clean.

Vegetius, upon the same principle, advises (k) to give the following composition. "Mix carefully in a mortar two ounces of wax, one pound of lard, half an ounce of tar, an ounce of cassia, and an ounce and a half of pepper, to be made into balls, the horse drinking with them an infusion of pomegranate-flowers in rough wine." Dr. Monroe (l) gives us the manner of rendering bees-wax miscible with water, which is, by melting it with a third part of hard soap and water, and beating them well together, then adding gradually more water. Dr. Huxley found this mixture to be very serviceable in North-America after evacuations, where there was much pain in the bowels. The fat about a sheep's kidney melted and mixed with milk, in the proportion of one fourth of the fat, is also found very proper in this view. This mild method answers much better than the use of astringents, and seems greatly confirmed by a horse's being cured in a few days by eating green lucerne when it first came in in spring, after his disorder had baffled every other method before tried for several weeks.

In this purging disorder, the extremity of the strait-gut sometimes comes out, in which case

(k) *Lib. III. c. xvi.*

(l) *P. 77.*

Vegetius (*m*) advises treating it in the following manner, if it is not readily got up when it first appears, before it is much swelled: scarify the gut with a lancet in the most prominent parts, and squeeze the scarifications so that the blood may be discharged; then foment it with warm water, and when it is softened, return it. Continue daily to put up the hand smeared with some warm ointment, till the ailment is healed.

Somewhat allied to the foregoing disorder is what is called *Molten Grease*, which is a fat or oily discharge with the dung, arising from the melting down of the fat of a horse's body, generally occasioned by violent exercise in hot weather. It is always attended with a feverish heat and restlessness, with startings, oppression, shortness of breath, and symptoms of internal pains. The horse soon loses flesh, and commonly becomes hide-bound, with a swelling in the legs. If not quickly remedied, it terminates in speedy death, or some obstinate disorder hard to be cured.

The cure should begin with plentiful bleeding, which should be repeated in proportion as the fever and oppression continue. The blood will appear replete with the dissolved fat, so as to feel greasy and slippery to the touch. Cooling nitrous drinks should be given, and at the same time such a purge as was before directed, to carry off the load fallen on the bowels, with mild glysters, to prevent pain and excoriation in the strait-gut. The horse should also be well rubbed, and cloathed warm, in order to encourage a discharge by the skin.

Though, in the beginning of a purging, as well as in the molten-grease, rhubarb, or other

warm medicines, do not answer, yet when the original cause seems to have been pretty well got the better of, they may then be occasionally substituted. Thus, rhubarb, or succotrine aloes, may be occasionally given to the quantity of from two drams to half an ounce, as shall be found necessary, and be occasionally continued until health is restored. M. Bourgelat (*n*) declares, that ipecacuanha is no less efficacious to horses than it is to men, given in the quantity of from two drams to half an ounce. This may be given instead of the rhubarb, or mixed with it, two drams of each. If the strength of the bowels is much impaired, warm bitters, such as a decoction of gentian, zédoary, orange-peel, Winter's bark, chamomile-flowers, may be given two or three times a day, and antimony mixed with bran or corn.

S E C T. XIV.

Of the Jaundice.

THIS Disease is known by the dusky yellowness of the eyes, of the inside of the mouth, and of the tongue and lips. The horse is dull, loses his appetite, and has a slow fever, which increases with the jaundice. He is often costive; his dung is of a light green, or pale yellow colour; his urine is high-coloured, and he stales with difficulty. The right side, or region of the liver, is hard and distended, and if the animal is much diseased, the cure is scarcely practicable, but generally ends with a wasting diarrhæa.

(*n*) *Ecole Vétérinaire ; Formules, p. 91.*

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The horse should be bled in proportion to the degree of fever. The strait-gut should be then emptied of the hard dung, and sharp stimulating glysters should be given; and also at the same time a purging draught, to carry the bile downward. An infusion of an ounce of fenna with two ounces of a purging salt will answer this purpose, because a stimulating medicine is first wanted. The belly may afterwards be kept open with balls composed of hard-soap an ounce, aloes half an ounce, as much millepedes, and honey; to be washed down with a decoction of madder, turmeric, and burdock. Antimony may be also given with the corn. If the disorder does not yield to this course, recourse must be had to calomel, two drams, with as much rhubarb, made into a ball; and the soap-balls and decoction be given between, and continued while the least yellowness remains. It will be of advantage to rub the belly well, and anoint it with the volatile liniment, or oil and spirit of hartshorn.

S E C T. XV.

Of Disorders of the Kidneys and Bladder.

INflammation of the kidneys is attended with the general symptoms of fever, together with a weakness, or a disinclination to move the back and loins, and a difficulty of making water, which appears thick, and sometimes bloody.

Copious bleeding is here necessary, and plenty of mild diluting drink, such as a decoction of mallows, marsh mallow roots, linseed, &c. Likewise, four ounces of oil rubbed in with the yolk of an egg, and two drams of nitre, may be given

three

three or four times a day in a draught of the decoction. The strait-gut should be emptied by the hand of all the dung, which, by it's pressure, may give pain to the kidneys, and by weighing on the neck of the bladder, prevent the discharge of the urine. At the same time, mild glysters with nitre and oil should be injected. This will be a much safer way of treating this disorder, than having recourse to the more stimulating diuretics.

If a difficulty of making water comes on unattended with a fever, yet with signs of a pain, or inaptitude to motion, in the back; the complaint may be supposed to be in the ureters, or vessels leading from the kidneys to the bladder. Here the intention of cure is much the same, namely, by diluents, and mucilaginous or oily medicines, to dilate and lubricate the passage, and thereby promote the discharge of the obstructing matter. Here the plentiful use of honey becomes likewise proper; and also diuretics of a more stimulating quality, such as, an ounce of balsam of capivi dissolved in the yolks of two or three eggs, and mixed with half a pint of the decoction of mallows, &c. Spirit of nitre may be added to all the drink that is given, and garlic or onions may be added to the decoction of mallows. Glysters in which two ounces of turpentine and half an ounce of nitre have been dissolved, with four ounces of oil, are here thought to be of peculiar service. Opiates, as they take off the spasms or contractions occasioned by the pain, are also of great advantage; and may be given to the amount of five or six grains in substance, or of the tincture in proportion, mixed with the decoction of mallows.

If, notwithstanding these means, a purulent matter is discharged along with the urine, it may

be feared that suppuration has come on in the kidney, and that it will end in a consumption. In this case, the same medicines as above are to be continued, especially the honey and balsam of capivi. If the urine becomes coffee-coloured and foetid, the inflammation is turning to a mortification, which is the fore-runner of a speedy death.

Vegetius (a) notes the following symptoms of a horse's having a stone in the bladder. "He is tortured, groans, extends himself, endeavouring to stale, he cannot piss freely, but his urine comes away by drops, a little at a time, and this he suffers daily. In order to ascertain it, put the hand, well oiled, into the strait-gut, and at the neck of the bladder, under the fundament, towards the root of the yard, feel with your fingers, and you will there perceive the stone. Too strong an effort sometimes bursts the bladder near the fundament, and lets the urine out by the fundament. In this case, the stone may be taken out by introducing the fingers, or a proper instrument, by the hole made in the bladder and rectum; and the wound may be cured by the use of mild glutinating glysters; though this is seldom to be expected on account of the violence which the parts had undergone before."—How far the soap-lee may be given with success for the stone in horses, I know not; or whether the stone may not be pressed so low by the anus, as that it may be cut upon, is a point which I shall not pretend to determine. Vegetius likewise observes, (b) that the bladder may be so displaced, or so distended with urine, by hard running, that the horse cannot stale; and in this case he advises "to put the hand well oiled into the fundament, and press it downward towards the

(a) *Lib. I. c. xlvj,* (b) *Lib. I. c. li.*

"yard,

“ yard, where will be found the bladder full of
 “ urine, which should then be drawn gently to-
 “ wards the fundament, on the right and left
 “ side; and this should be continued till the
 “ horse makes water.”

He also remarks, (c) that “ if, by hard la-
 “ bour or exercise, a horse be denied time to stale,
 “ an inflammation arises in the neck of the blad-
 “ der, may extend all along the urethra, and so
 “ straighten the passage that the creature feels
 “ great pain in voiding it's urine. The same too
 “ may proceed from several other causes, particu-
 “ larly hen's-dung, or other noxious things or ani-
 “ mals taken in with the food, and may be known
 “ by the horse's bending his legs and letting his
 “ belly down to the ground. He here advises, to
 “ bleed in any vein which appears nearest the part;
 “ but if a sufficient quantity of blood is not ob-
 “ tained from that vein, to bleed in the neck. The
 “ rectum should then be freed of dung, and after
 “ this six spoonfuls of pounded salt mixed with a
 “ pound of oil, be thrown warm into the horse's
 “ fundament, his head being placed downward, on
 “ a sloping ground, in order that the medicine
 “ may the more easily descend into his inward
 “ parts. The stimulus given by this will loosen
 “ his belly, and generally mitigate the pain. If
 “ this remedy gives relief but slowly, thrust your
 “ hand as before directed into the fundament, with
 “ great caution, towards the right side, and re-
 “ verse or turn it towards the left, pressing the
 “ bladder gently, that so the urine may flow out:
 “ but pressing it hard would be hurtful.”

He also proposes (d) the following general
 remedies. “ Reduce quick sulphur into pow-
 “ der, mix it with oil, and rub with it, as also

(c) *Lib. III. c. xv.*

(d) *Ibid.*

“ with warm water, the horse’s belly, yard, and
 “ loins.” The Sarmatians wrapped their horses
 in cloth from neck to feet, and fumigated them
 by strewing castor upon live coals set under them,
 so that the smoke of the coals and castor warmed
 the whole body. When the coals were with-
 drawn, the horse was walked a gentle pace, and
 staled soon. Powdered salt made into a small
 suppository with oil and honey, and inserted into
 the urethra, or hole in the yard, presently pro-
 vokes urine. Any crawling insect put under the
 sheath has the same effect. Standing near water
 that runs gently, provokes urine, as also does
 standing in a place where other horses have
 staled. Figs boiled in water, and given with
 nitre, answer the same purpose; and so does
 garlic. If the season of the year does not afford
 green food, give the horse hay sprinkled with
 honey and water, or barley boiled in water. Boil
 leeks, and squeeze out half a pint of their juice,
 which mix with six spoonfuls of oil and three
 spoonfuls of wine, and give it the horse to drink,
 after which walk him up and down.—It is pro-
 per, says Vegetius (e), to know the following tra-
 velling remedy, which is always at hand: after
 you have softened clay with the urine of any
 horse, mix it with wine, and after it is settled,
 pour the clear liquor through the nostrils; it pre-
 sently provokes urine.

Horses are likewise subject to a diabetes, or
 making water in too profuse a quantity, and this
 is seldom cured if they are weak or old. It is
 attended with a loss of appetite and strength. For
 cure, a decoction may be made in lime-water, of
 comfrey-roots, tormentile, red roses, pomegra-

(e) *Lib. I. c. lxi.*

nate-rind, oak-bark, or such like astringents, and a pint of this decoction given three times a day, with half an ounce of powdered Jesuits bark added to each draught. Calomel, given as an alterative, has been found efficacious when the foregoing has failed. Horses subject to a diabetes should not be suffered to drink too freely, and lime-water should be added to their common water.

When horses have been much strained by hard labour or violent exercise, they are liable to make bloody urine; but rest and a cooling regimen will soon remove it. The astringents usually prescribed in this case have very little effect; and the only medicine of that kind proper to be given here, is the Jesuits bark, to the quantity of half an ounce three times a day, or oftener if the case is very urgent.

P A R T II.

OF THE EXTERNAL DISEASES OF
HORSES.

I N T R O D U C T I O N.

I NOW proceed to treat of such disorders of Horses as appear externally, and whose seat is within the reach of manual assistance. In doing this, I shall begin with those of the simplest nature, and pursue the various appearances and changes that external injuries occasion; tracing likewise to their origin such external appearances as take their rise from internal causes. By following this plain and easy method, there will be no occasion to make use of many strange hard names, too commonly used, which, far from conveying even the smallest idea of the disorder itself, serve only to puzzle and confound those who are but little acquainted with them; and at the same time their natures will be explained on more general principles.

I shall begin with a bruise, as being the slightest external injury; though when it proceeds from violent causes, it may be productive of great evils.

S E C T. I.

Of Bruises.

A Bruise, or Contusion, is a hurt inflicted by a blunt instrument, which brings on a swelling, proceeding either from a stagnation of the circulating fluids in the bruised vessels, or rather from a number of the capillary vessels being broken.

If Bruises are not timely attended to, the obstructions may bring on inflammation, suppuration, or even gangrenes, and all their consequences. They may also be attended with inconveniencies arising from the part affected. On the joints, they bring on violent pains, inflammation, &c. : on the breast, a difficulty of breathing, the intercostal muscles being hurt : where the bones are slightly covered, the membrane next to the bones may be injured, as often happens in the head ; whence great pain, &c. Internal parts may also be hurt ; whence many bad symptoms, and even death.

I shall consider Bruises in three lights ; first, with a whole skin, and without any fluctuation of matter ; next, as having a fluctuation of matter ; and thirdly, as attended with a wound in the skin.

In the first of these cases, the intention should be to recover a free circulation in the obstructed vessels, and the absorption of the extravasated fluids. There are several methods successfully used for the cure of slight bruises : thus, cold water mixed with salt, vinegar, spirit of wine simple or camphorated, answer the purpose.

Horses are very subject to bruises on the withers, as it is called, or to be bruised by the saddle.

saddle. In this case, the part should be frequently bathed with warm vinegar, or verjuice; or a poultice may be applied, made with either of these and crumb of bread, or fine oatmeal, which last takes a better consistence than the former. Which ever of them is to be used, the poultice should be spread over with oil or hogs-lard, to prevent it's growing hard, or adhering too closely to the part. The following poultice, directed in the *Maison Rustique* (a), seems well adapted for this purpose. "Take a gallon of red wine, and boil it gently over a clear fire till it thickens; then add to it two pounds of wheaten flour, a pound of honey, and as much black soap; mix and lay it on the part affected. Where wine cannot be conveniently had, strong beer may be successfully used instead of it. On the third or fourth day, when all fear of inflammation is over, it will be adviseable to rub the part with opodeldoc, or some such warm spirituous application, which helps much to remove pain, as the friction does to force the obstructing matter into the circulation. The acrid astringents have here no good effect.

Though, at first, when a bruise is received, a small fluctuation seems to be felt, yet the extravasated fluid may by the above means, or rather by nature, be again taken into the circulation: but if a considerable quantity of blood, or other fluid, is felt under the skin, vent must be given to it, lest it putrify, and endanger the neighbouring parts. For this purpose, a strong lancet is the best instrument; and the incision should be made in the direction of the muscles and fibres of the part affected, yet so as that the discharge shall be made in the most depending

(a) *Tom. I. p. 206.*

part. The extravasated fluid being thus discharged, the incision may be dressed with any mild ointment, and covered with a wine or beer poultice, in order to recover the tone of the bruised vessels. The incision is to be treated afterwards in the manner that will be directed in the cure of an abscess.

If the bruise is attended with a wound in the skin, great care should be taken not to let any very acid application touch the wounded part; for the consequence would be, that all the wounded and contused flesh would be turned to a hard dead slough, which must be digested off by means of inflammation and suppuration; whereas if mild applications are used, much of the bruised flesh may again recover itself, and a kindly digestion will come on. Proper poultices may be applied over the dressings laid on the wounded part.

While these applications are used externally, bleeding must not be forgot, proportioned to the bruises and subsequent inflammation. The horse should have plenty of diluting warm drinks, in which nitre has been dissolved, in order to preserve the fluidity of the blood, and to carry off by urine the particles that may not be re-assumed into the circulation. This becomes particularly necessary in case the internal parts are hurt; and the body should be kept open by glysters and cooling purges.

S E C T. II.

Of Strains and Luxations.

NEARLY a-kin to bruises are strains, in which the ligaments of the joints, and often the tendons which end at or near the joints, and their muscles, are over-stretched; by which means some of the smaller vessels may be broken, and the like pain and swelling, often too inflammation, may arise, as in the former case; and nearly the same method of cure is to be pursued.

Bleeding becomes necessary if the pain and swelling are considerable. Vinegar or verjuice are to be applied externally, or a poultice made with either of them and flour and hog's-lard, or oil; or such a poultice of wine or beer as before directed. As time is necessary here for the strained parts to recover from the injury they have received, an external application which shall, by being bound moderately tight round the joint, give it some degree of strength, is necessary. For this purpose, there is not perhaps any thing better than wine or beer, with some small quantity of a farinaceous substance and oil, boiled to the consistence of a jelly or plaister, spread on leather, applied to the part, and then covered with some small binding to prevent it's being rubbed off; likewise taking care that this plaister do not quite surround the limb or joint to which it is applied, lest the binding of it like a ligature should stop the free circulation of the blood, and thereby cause the parts below it to swell. When there is no longer any danger of swelling and inflammation, and the joint begins to be strengthened, perhaps moderate exercise and

and the soft treading of the field is the most eligible situation for a horse.

Strains in particular parts may be distinguished by the impaired motion of the strained limb: for example, if the shoulder is strained, the horse stands with the fore-foot extended as if it were stiff, and when in motion he forms part of a circle with the lame leg. In this case, Vegetius (a) recommends the following application. "After the shoulder has been well embrocated with wine and oil in the sun, take half a pound of bay-berries, a pint of wine, as much oil, and three ounces of nitre, boiled to the consistence of an ointment. Let the shoulder be anointed with this ointment warm; let it be rubbed long at a time, and afterwards put the horse to swim."

Mr. Osmer (b), after rightly observing that the cause of lameness in the fore-part of a horse is not easily distinguished by those who are not attentive to it, because lameness there may be occasioned by strains in the muscular or tendinous part of the leg, from the shoulder to the foot of the horse, advises, when the muscles and ligaments of the shoulder are strained, to keep the horse as free from motion as possible, and to apply vinegar and discutient fomentations, which will probably bring him to a sound state.

When the muscles of the back and loins are strained, as not unfrequently happens through the fatigue of a long journey, the ruggedness of the roads, over-stretching in leaping, or carrying too great a burthen, the symptoms are, that the horse drags his hinder legs, his loins stagger and shake, he cannot gather his limbs together, his tail falls down, and he sometimes pisses

(a) *Lib. II. c. xliiv.*

(b) *Page 63.*

blood. Vegetius (c) here advises, that the horse be bled, that the blood taken from him be mixed with oil and nitre, and that his loins be thoroughly rubbed therewith. Internally, he orders three ounces of nitre in powder, three ounces of honey, and three ounces of oil, mixed with three pints of old wine, to be poured down his throat in four days, an equal quantity each day; and that then a quantity of cypress-leaves and barley-flour be kneaded with sharp vinegar, and laid upon the part affected.

The different kinds of lameness to which the hinder part of the horse is liable, are most easily distinguished from each other when he is put into motion. Thus, if the horse be lame in any part belonging to the foot, he will endeavour to ease that foot, by not setting it fully on the ground: if the lameness be in the fetlock joint, or in the tendons of the leg, or in the hock, or if it proceeds from swellings surrounding the hock, such causes will be manifest to the eye: if the lameness be in the stifle, he cannot so well extend the limb, but will drag his toe upon the ground more or less, according to the degree of injury he has received, as in a lameness in the shoulder: and if it be in the ligaments belonging to the joint of the hip, or whirl-bone, he will rest his foot indeed fully upon the ground, but will halt or step short in his trot, with that leg, though he may perhaps appear perfectly sound in his walk.

Extension and counter-extension are the proper methods of reducing dislocations. The part should then be rubbed with vinegar, and a cataplasm may be applied twice a day, composed of common salt and the white of eggs, mixed

with a little vinegar and oatmeal. During this application, rest must be allowed.

A dislocation of the hip-bone happens very seldom, and when it does, it proceeds from either a rupture or an elongation of the round ligament. Mr. Osmer (*d*) mentions his having seen two instances of this kind, the one in a horse and the other in a bullock; as well as a fracture of the thigh-bone, and of the *os ilium*.

“To distinguish, says he, with certainty the reality of these, it must be observed, that when the bone is broke in either of these cases, the animal will in a few days begin to rest upon that leg a little, and gradually more and more, till the bone consolidates and becomes united; but when the round ligament is ruptured, or elongated to a certain degree, the head of the bone falls from the socket, the leg swings, the animal cannot rest upon it at all; and, by continually bearing all the weight upon the other leg, he soon becomes lame of that also, and at last does not chuse to stand at all.—Moreover, in the case of elongation or rupture of the round ligament, the whole limb becomes longer; and in case of a fraction of the thigh-bone, it becomes shorter; but in a fraction of the *os ilium*, this abbreviation may or may not happen, as depending wholly on the nature and manner of the fracture.—The common lameness attending this joint is occasioned by the relaxed state of some of the ligaments belonging to it, brought on by some strain at first, and by exercise continued on such weak part.”

Vegetius (*e*) advises, in order to reduce a dislocation of the hip, that the foot of the sound side be shod with a sandal, or shoe made of broom, carefully bound on, and so to raise that foot, that the animal may be able to set down

(*d*) Page 57.

(*e*) Lib. III. c. xviii.

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the hoof of the lame limb flat and full upon the ground. In case of a luxation of the thigh, he advises that the horse be placed in the sun, that the hip be rubbed a very long while with warm wine and oil, till he sweats; that he be then pulled with a halter, and made to run by little and little, whilst another person, holding a thong or rope slack in his hand, follows him, and all of a sudden, in the midst of the animal's running, draws with violence the hip strait towards himself. If it gives a crack, the bone is returned to it's place, and he sets his feet down equally: but if the joint cannot be set right the first day, the hip should be pulled frequently on the second day in the same manner, till it return to it's place. — Strains in the lower joints are discovered by the lameness and swelling of the part.

Mr. Osmer (*f*) declares, that “ the best remedy for a relaxation of the sinue, is to make a whey with some alum boiled in milk, to foment the part with this whey, and to bind on the curds by way of cataplasm; and after a few days, colcothar of vitriol finely powdered and mixed with white of eggs, is to be applied as a charge every twenty-four hours, and a smooth bandage kept on the part.” — Here, I cannot help taking this opportunity to disapprove of the use of vitriol, or any such acrid application, in complaints of this kind; because it can scarcely be imagined that their particles can pierce the horse's skin so as to benefit the ligaments underneath; and if there is the least breach or sore in the skin, their effect must be the making of a slough, which must be cast off by means of inflammation and digestion, and thus occasion a new evil.

To remove inflammations, and to prevent induration and enlargement of the ligamentous parts and teguments of the fetlock joint, the consequence of repeated violence, it is a good custom to cause the joints of a horse, after a day's hard exercise, to be well fomented with flannels dipped in warm water. For want of this precaution, lameness often happens to this joint.

When the skin or ligaments are inflamed or enlarged by repeated violence, as aforesaid, the horse should be bled plentifully, have cooling salts given him, and be turned loose in some open building. The injured parts should be fomented twice a day with a decoction of emollient herbs, such as white lilly roots, mallows, elder leaves and flowers, bay-berries, or the like, boiled in water. The parts, when dry, are to be filled with some cooling ointment, and some of the fomentation should be thickened with oatmeal, to the consistence of a poultice, and kept thereon. When the tension and induration are gone off, more strengthening applications may be made use of, and the horse be turned to grass, and indulged with proper rest, in order that the diseased parts may recover their former fineness, tone, and strength. How much time and rest are here necessary, will appear to any man that has ever strained the tendons of his wrist or ankle. Let him reflect on the pain he has suffered from the least motion of the parts, and how long a time has been required before he could bear the extension of the joint, even when all appearances have been fair. Will not the case be the same with the horse? And yet jockeys will preposterously exercise them daily, to keep them in wind, say they, or prepare them for the race.

To

To cure these ailments in the joints of horses, the farrier blisters and fires upon the joint; by either of which, applied whilst the parts are inflamed, the inflammation thereof is certainly increased, and from thence a callosity of those parts is most likely to be intailed for ever. Such methods are as contradictory to the disorder, as, to use Mr. Osmer's words on this occasion, (g) endeavouring to extinguish fire by pouring on it spirits of wine. If the fire reaches no farther than the skin, little advantage can accrue to the tendon; but the fibres of the skin will become contracted and less pliant: if the fire reaches the membrane or sheath of the tendon, some of the glands, which serve to lubricate the tendon, are destroyed, and the tendon becomes more or less rigid: if the tendon be burnt, the consequence will be still worse. Firing will then act as a bandage, that will be sure to spoil the racer, and take away that pliancy which should be in the joint. Blistering and firing do indeed, as Mr. Osmer observes, (b) furnish an advantage to the farrier, because the leg is so much inflamed thereby, that it is impossible to ride the horse for a considerable time after the operation; so that if he happens to get sound, it is generally thought to be the effect of the blister and fire, but ought in reality to be imputed to the rest he has had.

It is not improbable that the first use of this barbarous practice may have been owing to somewhat of the following nature; that when complaints of this kind had been neglected till a humour had fallen on this part, the blistering, or cautery, by giving it vent, restored the use of the joint; and the farrier, not attending to this circumstance, erects this inhumanity into a ge-

(g) Page 70.

(b) Page 74.

neral practice. I therefore most perfectly agree with Mr. Osmer, (i) that firing seldom is of use in any kind of lameness, and that more horses are undone than benefited by it.

A horse's legs or hips may be broken; and in that case, if the bone start out beyond the skin, the cure is difficult, because the bandage must be undone every day to dress the wound: a fracture above the ham is incurable, because it does not admit of a ligature. If the fracture be without a wound, in a place which can be bound up tight, the cure may be attempted. To this end the horse must be suspended in a sling, so that his foot cannot reach the ground, lest his bone be displaced by his striking his hoof against the floor. The bone must then be set and bound round with a bandage, and splints on each side, with wool under them, to prevent their hurting the flesh. If a swelling or inflammation comes on, the bandage must be taken off, and the part embrocated with oil and wine, or vinegar, and a poultice of the same tied round. As soon as the swelling subsides, the bandage must be again recurred to, and at times renewed for six weeks; in less time than which the horse must not be permitted to stand upon the fractured limb.

S E C T. III.

Of Wounds.

THE general construction of the body being similar in other animals as in man, the same reasoning and treatment will nearly answer in both. I therefore shall certainly not be blamed

(i) Page 84.

if in this, and in some of the following divisions of this chapter, I choose for my guide Mr. Sharpe; a gentleman who has most highly distinguished himself in his profession.

“To conceive rightly,” says he, in his truly excellent Treatise on the Operations of Surgery, (a) “the nature and treatment of wounds, under the variety of disorders to which they are subject, it will be proper first to learn what are the appearances* in the progress of healing a large wound, when it is made with a sharp instrument, and the constitution is pure.

“In this circumstance the blood-vessels, immediately upon this division, bleed freely, and continue bleeding till they are either stopped by art, or at length contracting and withdrawing themselves into the wound, their extremities are shut up by the coagulated blood. The hæmorrhage being stopped, the next occurrence, in about twenty-four hours, is a thin serous discharge; and a day or two after an increase of it, though sometimes thickened and stinking. In this state it continues two or three days without any great alteration, from which time the matter grows thicker and less offensive; and when the bottom of the wound fills up with little granulations of flesh, it diminishes in it's quantity, and continues doing so till the wound is quite skinned over.

“It is worth observing, that the loss of any particular part of the body can only be repaired by the fluids of that distinct part: and, as in a broken bone, the *callus* is generated from the ends of the fracture, so, in a wound, is the *cicatrix* from the circumference of the skin only. Hence arises the necessity of keep-

(a) *Introduction, chap. 1.*

ing the surface even by pressure or eating medicines, that the eminence of the flesh may not resist the fibres of the skin in their tendency to cover the wound. This eminence is composed of little points or granulations called *fungus*, or proud-flesh, and is frequently esteemed an evil, though, in truth, this species of it is the constant attendant on healing wounds; for when they are smooth, and have no disposition to shoot out above their lips, there is a slackness to heal, and a cure is very difficultly effected. Since then proud-flesh prevents healing only by its luxury, and all wounds cicatrise from their circumference, there will be no occasion to destroy the whole *fungus* every time it rises, but only the edges of it near the lips of the wound; which may be done with gentle escharotics, such as lint dipt in a mild solution of vitriol; or for the most part only by dry lint, and a tight bandage, which will reduce it sufficiently to a level, if applied before the *fungus* has acquired too much growth. In large wounds, the application of corrosive medicines to the whole surface is of no use; because the *fungus* will attain to but a certain height when left to itself, which it will be frequently rising up to, though it be often wasted: and as all the advantage to be gathered from it, is only from the evenness of its margin, the purpose will be as fully answered by keeping that under only, and an infinite deal of pain avoided, which must attend the continual repetition of escharotics.

“ From this account of the progress of a wound made by a sharp instrument, where there is no indisposition of body, we see that the cure is performed without any interruption but from the fungus: a proper regard to this point is therefore here the principal object, with the use

use of such applications as will least interfere with the ordinary course of nature, which, in cases of this kind, will be such as act the least upon the surface of the wound; and, agreeably to this, we find that dry lint only is generally the best remedy through the whole course of dressing: at first, it stops the blood with less injury than any styptic powders or waters; and afterwards, by absorbing the matter, which in the beginning of suppuration is thin and acrimonious, it becomes in effect a digestive: during incarnation, it is the softest medium that can be applied between the roller and the tender granulations, and at the same time it is an easy compress upon the sprouting fungus.

“Over the dry lint may be applied a pledget of some soft ointment spread upon tow, which must be renewed every day, and preserved in it's situation by a gentle bandage; though in all large wounds, the first dressing after that of the accident or operation should not be applied in less than three days, when, the matter being formed, the lint separates more easily from the part; for no force should be used in the removal of it, nor should any more of it be taken away than what is loose and comes off without pain.

“Perhaps it may appear surprising,” continues Mr. Sharpe, “that I do not recommend other digestive or incarnative ointments, which have had such recommendation formerly for their efficacy in all species of wounds: but as the intent of medicines is to reduce the wound to a natural state, or a propensity to heal, which is what I have already supposed it to be in, the end of such applications is not wanted; in other respects dry lint is more advantageous. There are certainly many cases in which different applications

cations will have their several uses, as will be shewn in the sequel.

“ When a wound is recent (*b*), and the parts of it are divided by a sharp instrument, without any farther violence, and in such a manner that they may be made to approach each other by being returned with the hands, they will, if held in close contact for some time, unite by inosculation, and cement like one branch of a tree ingrafted on another. To maintain them in this situation futures have been invented.

“ From the description I have now given of the state of a wound proper to be sewed up, it may be readily conceived that wounds are not fit subjects for future when there is either a contusion, laceration, loss of substance, great inflammation, difficulty of bringing the lips into apposition, or some extraneous body insinuated into them; though sometimes a lacerated wound may be assisted with one or two stitches.

“ In stitching up a wound that has none of these obstacles, the needle is passed two, three, or four times, in proportion to the length of it, though there can seldom be occasion for more than three stitches. The method of doing it is this. The wound being emptied of the grumous blood, and an assistant having brought the lips of it together, so that they may lie quite even, the needle is pushed from without inwards to the bottom, and on from within outwards, using the caution of making the puncture far enough from the edge of the wound, which will not only facilitate the passing of the ligature, but will also prevent it from eating through the skin and flesh. As many more stitches as are made, will be only repetitions of the same process. When the threads

(*b*) *Treatise of the Operations of Surgery, chap. 1.*

are all passed, those in the middle of the wound should be tied first. The most useful kind of knot in large wounds is a single one first, and over this a little linen compress, on which is to be made another single knot, and then a slip-knot, which may be loosened upon any inflammation. In small wounds the compress is not necessary. One stitch is sufficient for a wound two inches long; and in large wounds they should be rather more than an inch distant. If a violent inflammation should succeed, loosening the ligature only will not suffice; it must be cut through and drawn away, and the wound be treated afterwards without any future future. When the wound is small, the less it is disturbed by dressing, the better; but in large ones there will sometimes be a considerable discharge; and if the threads are not carried through to the bottom of it, abscesses will frequently ensue from the matter being pent up underneath, and not finding issue. If no accident happens, the ligatures must be taken away after the lips of the wound are firmly agglutinated, and the orifices left by them are to be dressed.

“ It must be remembered that, during the cure, the future must be always assisted by the application of bandage, if possible; and this is of the greatest importance in horses, because their muscles especially have a very strong contracting power. The bandage with two heads, and a slit in the middle, is by much the best, and will in many cases be found practicable.

“ If a wound is attended with an hæmorrhage from a considerable blood-vessel, it must be stopped, for which purpose various means are used. If a vessel is entirely cut through, dry lint laid on it, and pressed upon it by proper bandage, is generally sufficient. If the hæ-

morrhage

morrhage is too large to be stopped by the application of dry lint, more powerful astringents are resorted to. The *lycoperdon*, vulgarly called *lupicrepitus*, or puff-balls, has been highly extolled for this purpose; the wound being filled with it's powder in the room of dry lint, with proper bandage; as is also the agaric of the oak duly prepared. Rectified spirit of wine, or what is better, and of the same nature, the fryar's balsam, applied cold to the wound, filling it with lint dipped in the balsam, and covering it with a large compress and bandage, is very efficacious. If these applications should fail, recourse must be had to the actual cautery: but the safest method is, to make a ligature round the vessel. This is performed by passing a strong waxed thread into the flesh under the artery, by the help of a crooked needle, and the sides of the artery will coalesce.

"Inflammation, pain, and convulsions often attend wounds. If the horse appears to be full of blood, bleeding is necessary in these cases, as are also fomentations, and the mildest applications. If convulsions come on from a loss of blood, opiates are the proper remedy."

S E C T. IV.

Of Inflammations and Abscesses.

I SHALL here again make Mr. Sharpe (a) my guide, and would recommend an attentive perusal of the foregoing section, of this, and of the following, to every one who would wish to rescue his horses from the savage and unskilful practice of most farriers.

(a) *Introduction, chap. ii.*

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Inflammations, from all causes, have three ways of terminating; either by dispersion, supuration, or gangrene; and a probable conjecture which of these will take place may be gathered from the horse's health, and other circumstances attending it. Thus, inflammations which happen in a slight degree of cold, and without any foregoing indisposition, will most likely be dispersed; those which follow close upon a fever, or happen to a horse full of humours, will generally imposthume; and those which befall horses greatly weakened by other distempers, will have a strong tendency to gangrene.

If the state of an inflammation be such as to make the dispersion of it safely practicable, this end will be best brought about by evacuations; such as plentiful bleeding, and repeated purges. The part itself must be fomented twice a day, and be embrocated with a mixture of three-fourths of oil of roses, and one-fourth of common vinegar. Such a poultice may also be applied as was before recommended for bruises. (b) The horse should be kept to a low diet and cooling drink, and the purge should be continued till the swelling is quite subsided. When the inflammation is gone off, perhaps gentle friction may contribute to remove the remaining swelling more than any other application.

Here it is supposed that the inflammation had so great a tendency to discussion, as by the help of proper assistance to terminate in that manner; but when it happens that the disposition of the tumour resists all discutient means, it becomes necessary then to desist from any farther evacuations, and, as much as can be, to assist nature in bringing on a supuration.

(b) See page 194.

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That matter will most probably be formed, we may judge by the increase of the symptomatic fever, and enlargement of the tumour, with more pain and pulsation on being touched. Inflammations after a fever, or other disease, almost always suppurate; but these soon discover their tendency, and should at first be treated gently, as if an imposthumation were expected. If the fever runs high, and the vessels seem clogged, experience has taught that bleeding quickens the formation of matter, though the practice should be followed with caution. If the horse is costive, his body may be kept gently open by glysters.

Of all the applications invented to promote suppuration, none are so easy as poultices; and of these there is not perhaps any one preferable to that made of bread and milk softened with oil. White lilly roots, linseed bruised, or, if greater warmth is necessary, fenugreek seed bruised, boiled onions, &c. may be added to the poultice. The tumour may be covered with the poultice twice a day, till it comes to that degree of ripeness as to require opening, which will be known by the eminence of the skin in some part of it, and a fluctuation of matter.

It appears to be but seldom that inflammations terminate in a gangrene in horses: but if the fever and other symptoms run so high, or the constitution of the animal is so far decayed, that a gangrene does come on, it generally proves fatal. If the tenseness of the skin goes off, and it feels flabby to the touch, if a thin ichor seems to be contained under the skin, and if the pulse quickens and sinks, and the animal grows cold, a gangrene is begun. In this case, scarifying by several incisions through the skin is judiciously practised, because it discharges a pernicious ichor, and makes way for whatever efficacy there

may be in topical applications. The common digestive ointments softened with oil of turpentine, seem as good a dressing as any for the scarifications; and upon them, all over the part, may be laid the *theriaca Londinensis* (London treacle), which should always be used in the beginning of a gangrene; or what is equally good, if not preferable, a cataplasm made with lye and bran, and applied warm; for this will retain it's heat better than most other topicals. Some recommend the use of the grounds of strong beer mixed with bread or oatmeal. These dressings, with spirituous fomentations, should be repeated twice a day. Warm cordial medicines should be given at the same time internally. Modern practice seems to establish the bark as the chief medicine in this case. It may be given to the quantity of an ounce every two hours in a mixture, in which wine may make a considerable share. After the separation of the eschar, the wound becomes a common ulcer, and must be treated as such.

If we attend to the thickness and strength of the skin of horses, we shall find that all abscesses in them should be opened. In small abscesses there is seldom a necessity for a larger opening than what will give a free discharge to the matter; and in large ones, where the matter spreads a good way under the skin, an incision should be made to it's utmost extent; or a circular or oval piece of the skin should be cut away, which at once lays open a great space of the abscess, so that it may be dressed down to the bottom, and the matter of it be freely discharged.

Notwithstanding the depending part of an abscess is esteemed the most eligible for an opening, yet it should be always on the supposition that the teguments are as thin in that place as in any other part of it; otherwise it will be generally

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adviseable to make the incision where nature indicates, that is, where the tumour is permanent, though it should not be in a depending part.

It is generally taught that critical abscesses should be opened before they come to an exact suppuration, in order to give vent the sooner to the noxious matter of the disease: but they who open before this period, miss the very design they aim at; since but little matter is deposited in the abscess before it arrives towards it's ripeness, and besides, the ulcer afterwards grows foul, and is less disposed to heal.

When an abscess is already burst we are to be guided by the probe where to dilate; and as the horse's skin is strong, the knife is the best instrument for opening farther. The manner of opening with a knife is by sliding it on a director, the groove of which prevents it's being misguided. If the orifice of the abscess is so small as not to admit the director, it must be enlarged by a piece of sponge-tent, which is made by dipping a dry bit of sponge in melted wax, and immediately squeezing as much out of it again as possible, between two pieces of tile or marble: the effect of this is, that the loose sponge being compressed into a small compass, if any of it is introduced into an abscess, the heat of the parts melts down the remaining wax that holds it together, and the sponge, sucking up the moisture of the abscess, expands, and in expanding opens the orifice wider, and by degrees, so as to give very little pain.

The usual method of dressing an abscess, the first time, is with dry lint only, or, if there be no flux of blood, with soft digestives spread on lint. If there be no danger of the upper part of the wound reuniting too soon, the dossils should be laid in loose; but if the abscess be
P 3 deep,

deep, and the wound narrow, the lint should be crammed in pretty tightly, in order to have afterwards the advantage of dressing down to the bottom without the use of tents, which are now almost universally decried; though indeed still too much employed by the very people who would seem to explode them most; so difficult is it to be convinced of the true efficacy of nature in the healing of wounds. Formerly the virtues of tents were much insisted on, as it was then thought absolutely necessary to keep wounds open a considerable time, to give vent to the imaginary poison of the constitution; it was supposed too, that they were beneficial in conveying the proper suppurative or farcotick medicines down to the bottom of the abscess; and again, that, by absorbing the matter, they preserved the cleanliness of the wound, and disposed it to heal. But this reasoning is not now esteemed of any force: surgeons at present know that a wound cannot heal too fast, provided that it heals firmly from the bottom; they are well satisfied also, from what they see in wounds where no medicines are applied, that nature of herself shoots forth new flesh, and is interrupted by any pressure whatsoever; besides, as to the conceit of tents sucking up the matter, which is esteemed noxious to healing, they are so far from being beneficial in the performance of it, that they are of great prejudice; for if the matter is offensive in it's nature, though they do absorb it, they bring it into contact with every part of the sinews; and if it be prejudicial by it's quantity, they do mischief in locking it up in the abscess, and preventing the discharge it would find if the dressings were only superficial: but in fact, matter, when it is good, is of no disservice to wounds with regard to it's quality; and surgeons should there-

therefore be less curious in wiping them clean when they are tender and painful. That tents are impediments to healing, rather than assistants, we may learn from considering the effect of a pea in an issue, which by pressure keeps open the wound just as tents do; and if there are instances of wounds healing very well, notwithstanding the use of tents, so there are also of issues healing up, in spite of any measures we can take to keep peas in their cavity. In short, tents in wounds, by resisting the growth of the little granulations of the flesh, in process of time harden them, and in that manner produce a fistula; so that instead of being used for the cure of an abscess, they never should be employed but where we mean to retard the healing of the external wound, except in some little narrow abscesses, where, if they be not crammed in too large, they become as dossils, admitting of incarnation at the bottom; but in this case, care should be taken not to insinuate them deeper than the skin, and they should be repeated twice a day, to give vent to the matter they confine. Tents do most good in little deep abscesses, whence any extraneous body is to be evacuated, such as small splinters of bone, &c." I have been the more particular in this quotation from Mr. Sharpe, in order the better to explode the too frequent use of tents in farriery.

The use of vulnerary injections into abscesses has been thought to bear so near a resemblance to the use of tents, that they both fell into disrepute almost at the same time. It has been said in their favour, that in deep abscesses, where no ointment can be applied, they digest, cleanse, and correct the malignity of the *pus*; but the fact is, that they do so much mischief by frequently distending the parts of the abscess, first,

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when they are injected, and afterwards by their addition to the matter generated in the abscess, that they are hardly proper in any case: though one of the great mischiefs of both injections and tents has been a mistaken faith amongst practitioners, that wherever their medicines were applied the part would heal; and, upon that presumption, they have neglected to dilate abscesses, which have not only remained incurable after this treatment, but would often have done so for want of a discharge if they had been dressed more superficially.

In dressing wounds it is common to apply the medicines warm or hot, upon the supposition that heated ointments have a stronger power of digesting than cold: but as any medicine will soon arrive to the heat of the part it is laid on, whether it be applied hot or cold, the efficacy of the heat can avail but little in so short a time: and as dossils dipt in hot ointments are not cleanly, and even grow stiff and painful, I think it rather preferable to apply them cold; or perhaps, in winter, a little warmed before the fire after they are spread; observing, if the ulcer be uneven, to make the dossils small, in order that they may lie close. Over the dossils of lint may be laid a large pledgit of tow spread with basilicon, which will lie soft on the part. In this manner the dressings may be continued till the cavity is incarned; and then it may be cicatrised with dry lint, observing to keep the fungus down as before directed.

In the course of dressing, it will be proper to have regard to the situation of the abscess, so as to favour the discharge as much as possible; and to this end the discharge must be assisted by compress and bandage. The frequency of dressing will depend on the quantity of discharge: once
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in twenty-four hours is generally sufficient. I have already mentioned not to be scrupulously nice in cleaning a wound; but it is worth remarking, that a sore should never be wiped by drawing a piece of tow or rag over it, but only by dabbing it with lint. The parts about it may be wiped clean in a rougher manner, without any prejudice. Another caution necessary in the treatment of abscesses is, that we should not on all occasions search into their cavities with the probe or finger, because this often tears them and indisposes them for a cure.

SECT. V.

Of Ulcers.

AS Horses have been more cruelly treated in complaints which come under this denomination, than perhaps in any other disorder, I cannot act with greater humanity towards that valuable part of the creation, nor with more justice to their owners, than by still continuing to be guided by Mr. Sharp, who has with so much judgment, and a praise-worthy contempt of mystery, thrown off the trappings of surgery, and reduced it to plain and just principles, in which he had the ease and welfare of the patient constantly in view.

When a wound or an abscess, says he, (a) degenerates into so bad a state as to resist the methods of cure before laid down, and loses that complexion which belongs to a healing wound, it is called an ulcer; and as the name is gene-

(a) *Treatise of the Operations of Surgery; Introduction, chap. iii.*

rally borrowed from the ill habit of the fore, it is a custom to apply it to all sores that have any degree of malignity, though they are immediately formed without any previous wound or abscess.

Ulcers are distinguished by their particular disorders, though it seldom happens that the affections are not complicated; and when we lay down rules for the management of one species of ulcer, it is generally requisite to apply them to almost all others. However, their most distinguished characters are, the callous ulcer, the sinuous ulcer, and the ulcer with caries of the adjacent bone; though there be abundance more known to surgeons, such as the putrid, the corrosive, the varicous, &c. but as they have all acquired their names from some particular affection, I shall speak of the treatment of them under the general head of ulcers.

It will often be in vain to pursue the best means of cure by topical applications, unless we are assisted by internal remedies: for as many ulcers are the effects of a particular indisposition of the body, it will be difficult to bring them into order while the cause of them remains with any violence, though they are sometimes, in a great degree, the discharge of the indisposition itself; as in contagious diseases, and also in other disorders which proceed from some general indisposition of the blood. These general or chronic indispositions will be considered when I come to treat of the use of alteratives.

When an ulcer becomes foul, and discharges an acrid thin ichor, the edges of it, in process of time, tuck in, and growing skinned and hard, give it the name of a *callous ulcer*, which, so long as the edges continue in that state, must necessarily be thereby prevented from healing: but we are not immediately to destroy the lips of it,

it, in expectation of a sudden cure; for while the malignity of the ulcer remains, which was the occasion of the callosity, so long will the new lips be subject to a relapse of the same kind, however often the external surface of them be destroyed; so that when we have to deal with this circumstance, we are to endeavour to bring the body of the ulcer into a disposition to recover by other methods. Rest, with the assistance of powerful internal medicines, or even a rowel near the part affected, may give such a diversion to the humour, as shall dispose an ulcer to heal; yet when the surface of the ulcer begins to yield thick matter, and little granulations of red flesh shoot up, it will be proper to quicken nature by destroying the edges of it, if they remain hard. The manner of doing this, is by touching them for a few days with the lunar caustic, or infernal stone. If the part will bear the application of a compress and bandage, the pressure soon reduces the callus. Some choose to cut them off with a knife; but this is very painful, and not, as I can perceive, more efficacious; though when the lips do not tuck down close to the ulcer, but hang loose over it, the easiest method is cutting them off with the scissars.

To digest the ulcer, and to procure good matter from it when in a putrid state, an infinity of ointments have been invented; but the yellow basilicon alone, or softened down sometimes with turpentine or balsam capivi, and sometimes mixed up with different proportions of red precipitate, seems to serve the purposes of bringing an ulcer on to cicatrification, as well as any of the others. When the ulcer is incarnated, the cure may be finished as in other wounds; or if it does not cicatrise kindly, it may be washed with lime-water, or with the same water in a

pint of which half a dram of corrosive sublimate mercury has been dissolved, or dressed with a pledgit dipt in tincture of myrrh.

The red precipitate has of late years acquired the credit it deserves for the cure of ulcers. When mixed up with basilicon, it is most certainly a digestive; since it hardly ever fails to make the ulcer yield a thick matter in twenty-four hours, which discharged a thin one before the application of it. As greater proportions of it are added to the ointment, it approaches to an escharotic; but while it is mixed with the ointment, it is much less painful and corrosive, than when sprinkled on a sore in powder: in which last form it is a strong escharotic, and much of it can never be used without making a slough. On that account, when the nature of the ulcer requires so strong an escharotic, the powder should not be renewed till the former slough is cast off; which it will generally be the next day, or at farthest the day after.

If the ulcer should be of such a nature as to produce a spongy flesh, sprouting very high above the surface, it will be necessary to destroy that flesh by some escharotics, or the knife. This *fungus* differs very much from that which belongs to healing wounds, being more prominent and lax, and generally in one mass; whereas the other is in little protuberances. It approaches often towards a cancerous complexion; and when it rises from some glands, does sometimes actually degenerate into a cancer. The lunar caustic, or infernal stone, is here the best escharotic; and the precipitate, or what I think better, the angelic powder (a composition of precipitate and burnt allum), may be also used.

In ulcers also, when the subjacent bone is carious, great quantities of loose flabby flesh will
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grow up above the level of the skin; but as the caries is the cause of the disorder, it will be in vain to expect a cure of the excrescence, till the rotten part of the bone is removed; and every attempt with escharotics will be only a repetition of pain to the diseased, without any advantage.

In ulcers of the glands, and indeed of almost every part, this disorder is very common: but before trial of the severe escharotics, I would recommend the use of the strong precipitate medicine, with compress as tight as can be borne without pain; which I think generally keeps it under.

Mr. Sharpe informs us, that he had the pleasure of seeing an eminent surgeon bring an ulcer soon to discharge good matter, and put on as kindly an appearance as he ever beheld in a sore, by the use of pledgits dipt in balsam capivi with an equal quantity of oil of olives, applied as hot as the patient could possibly bear. What seemed surprizing to him was, that a heat, which he was persuaded would have blistered the skin, mended the appearance of the sore. The surgeon declared, that he had found this manner of application to be not only the best and most effectual escharotic, the pain of which is but of short duration, but also that it fills the sore with the best flesh. If the aspect of an ulcer is white and smooth, as happens in ulcers accompanied with a dropsy, external applications will answer no purpose, till the constitution is repaired.

When ulcers or abscesses are accompanied with inflammation and pain, they are to be assisted with fomentations made of some of the drying herbs, such as wormwood, bay-leaves, and rosemary; and when they are putrid and corrosive, which circumstances give them the name of *phagedenic* ulcers, some spirit of wine should be

be added to the fomentation, and the bandage be also dipped in brandy or spirit of wine; observing in these cases where there is much pain, always to apply gentle medicines till the pain is removed. If a *varix* attends an ulcer, the most certain cure is to dilate it, and tie it below with a waxed thread.

As to the frequency of dressing and fomenting, I think it may be laid down as a general rule in all sores, that where the discharge is sanious and corrosive, twice a day is not too much; and if the matter be not very putrid and thin, once will suffice. When the pain and inflammation are excessive, bleeding and other evacuations will often be serviceable. In horses, we are deprived of the horizontal position, which in man is found to be of so great importance to the cure of ulcers in the legs, that without it the skill of the surgeon will often avail nothing: but the horses in this case should certainly have all the rest that can possibly be given them.

As old ulcers are very apt to break out again, it is proper to put a rowel as near the part as can conveniently be, in order to continue a discharge which the constitution has been habituated to, and to prevent it's falling on the cicatrix; and in the legs, a bandage should be continued for some time after the cure. The neatest is the strait stocking, which may be made to fit a horse, as well as a man. If the leg is œdematous after the healing of the ulcer, it may be worn with safety and advantage.

When an ulcer or abscess has any sinuses or channels opening and discharging themselves into the sore, they are called *sinuous* ulcers. If these sinuses continue to drain a great while, they grow hard in the surface of their cavities, and then are termed *fistulae*, and the ulcer a *fistulous* ulcer;

ulcer: also if matter be discharged from any cavity, as those of the joints, the abdomen, &c. the opening is called a *sinuous ulcer*, or a *fistula*.

The treatment of these ulcers depends on a variety of circumstances. If the matter in the sinus be thick, strict compress and bandage will sometimes bring the opposite sides of the sinus to a re-union: if the sinus grow turgid in any part, and the skin thinner, shewing a disposition to break, the matter must be made to push against that part, by plugging it up with a tent; and then a counter-opening must be made, which often proves sufficient for the whole abscess, if it be not afterwards too much tented, for this locks up the matter, and prevents the healing; or too little, which will have the same effect; for dressing quite superficially suffers the external wound to contract into a narrow orifice before the internal one is incarned, which does almost as effectually lock up the matter, as a tent. To observe then a medium in these cases, a hollow tent of lead or silver may be kept in the orifice, which at the same time that it keeps it open, gives vent to the matter. When, after some trial, the matter does not lessen in quantity, and the sides do not grow thinner, the sinus must be dilated the whole length, if practicable; for there is then no expectation of a cure without dilation. When abscesses of the joints discharge themselves, there is no other method of treating the fistula, but by keeping it open with the cautions before laid down, till the cartilages of the extremities of the bones being corroded, the two bones shoot into one another, and form of the joint an *anchylosis*, or stiff joint.

When an ulcer with loose rotten flesh discharges more than the size of it should yield, and the discharge is oily and stinking; in all probability

probability the bone is carious; which may easily be known by running the probe through the flesh. If it be so, it is called a *carious* ulcer. The cure of these ulcers depends principally upon the removal of the rotten part of the bone, without which it will be impossible to heal. Those caries which happen from the matter of the abscesses lying too long upon the bone, are most likely to recover.

The method of treating an ulcer with a caries, is by applying a caustic of the size of the scale of the bone that is to be exfoliated, and after having laid the bone bare, to wait till such time as the carious part can, without violence, be separated, and then to heal the wound. I caution against violence, because the little jagged bits of bone that would be left, if we attempted exfoliation before the piece was quite loose and disengaged from the sound bone, would from little ulcerations, and very much retard the cure. Several applications have been devised, in order to quicken the exfoliation; but that which has been most used in all ages, is the actual cautery, with which the naked bone is burnt every day, or every other day, to dry up, as is said, the moisture, and by that means procure the separation. Now, if we consider the appearance of a wound when a scale of a bone is taken out of it, there is hardly any question to be made, but that burning retards, rather than hastens, the separation: for as every scale of a carious bone is flung off by new flesh generated between it and the sound bone, whatever prevents the growth of these granulations, will also in a degree prevent the exfoliation; and this must certainly be the effect of a red-hot iron applied so close to it, that it may even damage parts of the bone which are sound, and thereby add to the number of scales

to be exfoliated. With or without the actual cautery, it is very uncertain how soon the exfoliation may happen, it taking sometimes many months, and at other times not so many weeks: nay, Mr. Sharp says that he has, upon cutting out the eschar made by a caustic, taken away at the same time a large exfoliation. If it be only uncertain whether the actual cautery is beneficial or not, the cruelty that attends the use of it should entirely banish it out of practice. It is likewise often employed to keep down the fungous lips that spread upon the bone: but it is much more painful than the eschoratic medicines: though there will be no need of either, if a regular compress be kept on the dressings; or if a flat piece of the prepared sponge before-mentioned, of the size of the ulcer, be rolled on with a tight bandage, it will swell on every side, and dilate the ulcer without any pain.

Some caries of bones are so very shallow, that they crumble insensibly away, and the wound fills up: but when the bone will neither exfoliate, nor admit of granulations, it will be proper to scrape it with a rugin, or perforate it in many points with a suitable instrument down to the quick. The dressing of carious bones, if they are stinking, may be doffils dipt in the tincture of myrrh; otherwise, those of dry lint are easiest, and keep down the edges of the ulcer better than any other gentle application. Very good success has attended the use of the balsam capivi and oil, as recommended by Mr. Sanxay, in such cases.

That noble animal, the horse, is, as well as his rider, liable to gun-shot wounds, particularly in battle. What renders these wounds so alarming, is the contusion and laceration of the parts, and the admission of extraneous bodies into them. The treatment of these wounds consists in re-

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moving the extraneous bodies as soon as possible; to which end the horse must be put into the same posture, as near as may be, as when he received the wound. If the bullet cannot be extracted this way, nor by cutting upon it, which should be practised when the situation of the blood-vessels, &c. does not forbid, it must be left to nature to work out, and the wound be dressed superficially; for we must not expect that if it be kept open with tents, the bullet, &c. will return that way: and there is hardly any case where tents are more pernicious than here, because of the violent tension and disposition to gangrene which presently ensue. To guard against mortification in this, and all other violent contused wounds, it will be proper to bleed immediately, and soon after to give a glyster. The part should be dressed with soft digestives, and the compress and roller applied very loose, being first dipt in brandy or spirit of wine. The next time the wound is opened, if the appearance threaten danger, the spirituous fomentation may be employed, and continued till the danger is over. In gun-shot wounds, it seldom happens that there is any effusion of blood, unless a large vessel is torn; for the bullet makes an eschar, which usually separates in a few days, and is followed with a plentiful discharge. When the wound is come to this period, it is manageable by the rules already laid down.

When burns are superficial, not raising suddenly any vesication, spirits of wine give the speediest relief; for by their quick evaporation, they render the part so cool that inflammation is prevented, much more effectually than by the application of any other less volatile, and therefore less cooling substance. Though this reason was not known till within these few years,

years, yet the practice was very frequent among persons whose trade subjects them often to this misfortune. If the burn excoriates, the spirit would turn the sore to a slough, and therefore must not then be made use of; but, instead of it, a mild application, such as oil, or a mixture of oil and ointment of elder. When the excoriations are very tender, flannels wrung out of warm milk and applied hot, are very comfortable. If the burn has formed eschars, they must be dressed with a soft digestive, till they cast off, and then cured as before directed. Great care is necessary to keep down the fungus, to which end, the edges may be dressed with lint dipt in a weak solution of vitriol, and afterwards dried; or they may be touched with the vitriol-stone. There is also greater danger of contractions from burns after the cure, than from any other wounds: to obviate which, embrocations of neat's-foot oil, and keeping the part extended, are absolutely necessary.

S E C T. VIII.

Of Tumours.

ENCYSTED Tumours, being essentially different from those which tend to suppuration, claim to be treated of separately. Under this head, I shall not only consider such tumours as do not usually terminate in suppuration, and are properly called *encysted* tumours, but also, with Vegetius, include a *ganglion*, a *varix*, and an *exostosis*.

The *encysted* tumours are distinguished by the appellations of *atheroma*, *steatoma*, and *meliceris*; names given to denote the different consistence of

the matter contained in them (*b*), as also their being contained in a surrounding coat; and to them may here be added a *ganglion*, because the method of cure is the same for all. The coat which surrounds them sometimes adheres, but generally does not, to the parts underneath it. They are without pain, and presage no great danger, unless they grow very large. If they are near a joint, or so situated as to incommode the motion of it, they should be cut out; otherwise they may continue long without much inconvenience.

The thickness of a horse's skin renders every other means of cure besides extirpation ineffectual. To this purpose Vegetius advises, (*c*) "That the horse be laid down and bound, and that on the part affected an incision be made lengthways, with a knife, on the right and left sides, in proportion to the largeness of the tumour, leaving in the middle a small swarth of the skin which is above the tumour untouched: the tumour being then cut out, the part is healed without leaving a scar." If the tumour is too large to admit of a swarth being left in this manner, a longitudinal incision must be made upon the tumour, and if this does not appear sufficient, let another incision be made across the former, till the tumour is laid sufficiently bare. The tumour is then to be dissected out, without wounding it's coat, if possible, or any vessel or membrane that may be contiguous. The tumour being extracted, if the hæmorrhage be small, the lips of the wound may be brought together, and being retained by proper compress and bandage, the wound is ge-

(*b*) The matter contained in the *atheroma* resembles milk-curd; that in the *steatoma* is composed of fat, or a suety substance; and the contents of the *meliceris* look like honey.

(*c*) *Lib. ii. c. xxx.*

nerally cured in a few days. If the hæmorrhage is profuse, it must be stopped as before directed; but if, by accident or necessity, any part of the including cyst or coat should be left, it must be taken away by the use of escharotics, such as the lunar caustic, or, if milder will do, red precipitate may be used, and the slough be brought away by mild digestives: for if the least part be left, there is danger of a relapse.

Hard swellings in the glands in any part of the body, but especially in the neck and about the head, which have not a tendency to a kindly supuration, should also be cut out in the same manner as soon as they are observed; for the longer they remain, the larger, and therefore the more troublesome they become. Of this kind is, in particular, that which, for want of proper care in bleeding in the neck, or afterwards, frequently falls on the part, is attended with many bad symptoms, and does not digest kindly.

Mr. Osmer (*d*) here very properly advises to the following effect, "Warm fomentations, cooling ointment, and a poultice of bread and milk, applied as soon as the evil is perceived, will very probably remove it. But if that method should fail, a rowel is to be put into the skin, in the middle of the horse's bosom, and with a tobacco-pipe, or any other tube, the skin to be blown up quite to the part affected; in order that an immediate derivation may be made therefrom as soon as the rowel runs. If, after this, any swelling or induration should still remain on the neck, it will now be removed by poultice and fomentations, or by the following mixture:

"Take of spirit of wine four ounces, camphor and bole powdered, each one drachm,

aqua fortis twenty drops; dip some lint or tow in some of this, apply it to the part, and bind over it some warm thick cloaths, without which this application does no good on any occasion."

Also for swellings on any part of the back or withers, occasioned by bruises from the saddle, he declares this medicine more efficacious than any other he is acquainted with; for that it will in a few days either entirely disperse such swelling, or bring it to a head: and what is particular, adds he, when matter is produced, the swelling itself is of much less magnitude than it would be by any other application productive of matter. It may be used twice a day, rubbing some of it upon the swelling, and wetting with it some lint or tow to be bound on the part. As soon as the matter is formed, and perceived to fluctuate under the finger, it should be let out with a knife, and some lint dipped in this mixture, and applied to the part once or twice a day, will cure it without any digestive or other means. Mr. Osmer farther observes, that it will cure a rawness on the back, or other part, if the fungus flesh be not grown too high.

When an extraordinary dilatation happens in the coats of the veins it is called a *varix*, or blood-spavin, and is seldom attended with pain or much inconvenience. A compress and proper bandage sometimes give an opportunity to the coat of the vein to recover itself. If this does not suffice, and if the swelling is at all troublesome, the effectual way of curing of it is, by laying it open the whole length with a lancet, discharging the grumous blood, and healing it up as a common wound. If an hæmorrhage ensues, a ligature may be made on the vein above and below the incision.

When

When an acute eminence, or excrescence, which is properly called an *exostosis*, pushes preternaturally above the bone, creating no pain or inconvenience, and unaccompanied with a *caries*, the best way is to let it alone; but if, on the other hand, it impedes any action, or produces great pain or other mischief, it will be adviseable to take it away. For this purpose an incision must be made in the skin, large enough to lay the whole tumour bare; the next day holes must be bored in the tumour to the depth of the natural surface of the bone, and so near to each other that it may be pierced like a sieve; then the whole surface so pierced must be taken off with a chissel and mallet, and the wound be afterwards treated as already directed when an exfoliation is waited for.

Mr. Osmer says, (e) that the most proper method of curing *ring-bones*, *bone-sparvins*, and *splints*, which are *exostoses*, is as follows. "First, clip the hair from the diseased part; make several punctures on that part through the skin with a sharp-pointed instrument, make a longitudinal incision through the skin above the diseased part, about the middle thereof; there introduce a cornet, and dilate the skin with it as far as the swelling reaches. Make another smaller longitudinal incision through the skin below the swelled part, directly opposite to the wound above, in doing which, your probe introduced at top will direct you. At the superior wound a caustic, wrapped up in a piece of lint, is to be introduced, and there left. The caustic dissolved, is carried off by the inferior wound. The whole is directly to be covered with a warm adhesive charge; and this is the whole of the

(e) Page 88.

Q 4

operation.

operation. The caustic thus introduced under the skin acts both ways, namely, on the membrane underneath it, and on the outer tegument upon it: thus the membrane, the outer tegument, and the charge, throw themselves off together, and the diseased or swelled part becomes fair and smooth. The horse should be turned out, or kept in an airy stable; and if the charge comes off before the wound is well, another should be immediately applied. But in spite of this, and all other methods used for these disorders, the horse will very frequently remain full as lame as he was before, although the appearance of the disease is removed; the reason of which is, that the periostium only is sometimes diseased, at other times the bone itself, and it's cellular part."

Excrescences, which may also be included under this head, are in general easily got rid of. If they grow from a small neck, a ligature is the easiest cure. This is performed by tying very tight, so as to interrupt the circulation, round the root of the excrescence a well-waxed thread. The knot should be a running one, that it may be tightened if necessary. In a few days, the neck of the excrescence will mortify, and the whole will fall off. If the neck is too large to admit of a ligature, the excrescence must be cut off: and as a branch of an artery supplies it with blood, and often brings on a troublesome hæmorrhage, it is best at once to tie up the artery, in the usual way.

By a violent effort, or other accident, the guts or caul of a horse may be forced out at the navel, or through the ring of the muscle in the groin into the scrotum or cod. The swellings occasioned by the ruptures are of different sizes, according

according to the quantity of caul or gut contained in them.

On their first appearance, endeavours should be used to return them, which is sometimes easily done, if they are soft and yield to the pressure of the hand; and in this case their return is attended with a noise. If the swelling is hard and painful, a large quantity of blood should be immediately taken away, to remove the tendency to inflammation, and lessen the stricture of the parts. The part ruptured should be fomented with water as cold as can be procured; and it's natural cold may be increased by throwing into it some salt, or rather sal ammoniac, which adds much to the chilliness of water. This is done to lessen the distension of the gut from rarefied air or vapour contained in it, and to prevent inflammation in the teguments. In the mean time it is proper to throw up stimulating glysters, the effect of which often is, that the gut is reduced as soon as the glyster operates. If the rupture has been of so long a standing that the parts adhere, or cannot be reduced, a suspensary bandage is the only remaining relief; and a proper steel truss, together with care to guard against any violent exertion of strength, the only means of preventing it's return.

S E C T. VII.

Of Cutaneous Diseases.

Cutaneous diseases, for the most part, take their rise from a general distemperature of the juices, in the writings of farriers called *humours*. And indeed, though the strict meaning of
of

of this word has not yet been very accurately ascertained, their use of it is in some measure countenanced by certain general expressions in the writings even of physicians, such as *nervous*, *scorbutic*, &c. This last word, perhaps, expresses nearly what *humours* are in horses. However, such as it is, I shall, with Mr. Osmer (a), "For the sake of peace, distinction, and custom, be well content that this good old phrase stand it's ground unmolested;" meaning by it, that there is, either in the blood and juices, or in the vessels, some distemper which renders the circulation imperfect in the capillary vessels, so that eruptions, swellings, &c. happen in different parts of the body. This imperfection being general, the cure is usually attempted by the use of medicines which, having a general effect on the constitution, are called *alteratives*; because they, for the most part, produce no immediate sensible operation, but imperceptibly restore a proper tone to the vessels, and due consistence to the blood and juices. I shall give a short account of the medicines usually comprehended under this denomination, before I treat of the cutaneous diseases for which they are used.

Of Alterative Medicines.

Nature affords us in the spring, and during the beginning of summer, one of the most efficacious, as well as most universal *alteratives*, in the juice of succulent plants then in vigorous vegetation. Plants at that time abound in a watery juice, in which is contained much of the native salt of the plant. This salt renders them at that season more peculiarly purgative than when they

are farther advanced towards ripeness, in which last stage their juices become thicker, tending more to an oily nature, and therefore are more nourishing. The salt in the spring juices renders them more active in removing obstructions every where in the course of the circulation. So powerful resolvents are they then, that Dr. Boerhaave has recorded an observation made by butchers, purporting, that though stall-fed cattle generally have gall-stones, yet no such are found in cattle fed on grass, and killed in the latter end of the summer.

The fine coat which foaling soon gives to horses is an evident proof of it's utility ; and every prudent man will, in order to preserve the health of his horses, cultivate such plants as are observed to abound in this so salutary juice. In the opinion of the antients, no plant exceeds lucerne in this respect, and the experience of the moderns has amply confirmed their judgment. I have instanced several proofs of it in my system of husbandry, and many more might be adduced if necessary. So peculiarly excellent is lucerne for this purpose, that, if it was of no other use, it would highly deserve all the care we could bestow upon it: but when we reflect, that, added to this, it is the most profitable of any plant in the quantity as well in quality of fodder it yields, we have the strongest motives to cultivate it with all possible attention. The use of carrots in the winter must also be of great advantage, both as food and as physick ; for, containing a rich saponaceous juice, they are deobstruent as well as nourishing. Even turnips, given with their hay, have been found to be beneficial to horses,

Before

Before the horse is put to grass (b) (as many do their young ones till they are seven or eight years old) he must be bled, and not put to grass till three days after, choosing the time when it is high enough for him to crop it by whole mouthfuls. He should then be left day and night in the pasture, for at least a month, without currying, dressing, or bleeding; for the coolness of the grass will purge him sufficiently, restore his legs, purify his blood, and cure him of all itchings in the skin. Only care must be taken to make him drink at noon and evening. He should be taken from pasture when the heat of the weather begins to harden the grass, because it then has no longer the same virtue as when fresh and tender; and the flies also would then be too troublesome. The after-math, or second growth after mowing, is not at all good for horses either green or dry.

When the horse has fattened at grass, before he is put to work, he must be fed with hay and oats for twelve days, be bled, and not made to labour hard at first; and in order to kill or force out the worms which the grass may have engendered in him, he should be made to take a pound of fresh butter, and half an ounce of mild sublimate in powder mixed, made into balls, and given in a pint of red wine. Or, instead of sublimate, four ounces of cinnabar in powder may be mixed with the butter.

Salt-marshes are found to be of singular benefit to horses, probably on account of the sea-salt which enters into the plants that grow in such marshes, from the salt water's overflowing them at times: for it appears, that the fixed salt obtained by burning such plants, is of the nature

(b) *Maison Rustique*, tom. 1. p. 244.

of that salt which is yielded by the plant kali, commonly called barilla.

The author of nature has been remarkably kind to the brute creation, in bestowing upon them an instinct which directs them in the choice of their food, with a seeming judgment superior, perhaps, to what our boasted reason gives us. Their love of salt, when at a great distance from the sea, is an evident instance of this: for, as was before observed, wherever they find an earth in which salt abounds, they at times flock thither, and lick up that earth. This is also a convincing proof of the propriety of frequently giving salt to horses, as well as to other cattle, as an alterative medicine.

Mr. Osmer (c) very rightly recommends the use of salt for horses, from the salutary effect it is observed to have on the human species, when pursued for a due course of time; and as horses are fond of it, it may be given mixed with their corn or hay, to the quantity of two or three ounces a day, or such quantity as shall keep them gently open.

M. Bourgelat, in his History of Drugs (d), judiciously wishes that all duty was taken off sea-salt used as a medicine for cattle, and especially for sheep. Now, as in this kingdom, salt employed in the manure of land is already exempt from duty, it is scarcely to be doubted but that, if a proper representation of it's great utility in this respect was made to Parliament, the tax would also be remitted for what should be used for this purpose.

Nitre, or salt-petre, has nearly the same qualities as sea-salt; and as it has been so often and so justly recommended in all disorders at-

(c) Page 189.

(d) Page 48.

tended with heat, little need be said of it here. Mr. Osmer gives a remarkable instance of the large quantity of this salt which a horse may take without being hurt by it. "A horse, says he (e), mad with the staggers, broke out of the stable belonging to a powder-mill, and got to a large cistern of water, in which so much salt-petre had been dissolved, that it was barely in a state of fluidity. He drank, or rather swallowed, several gallons. This soon promoted a very copious secretion by the urinary passages, after which he became immediately well, without any farther assistance. Yet others, he observes, from a difference of constitution, more particularly when they eat grass, shall not be able to take the smallest quantity of it without being affected with the gripes or colic: therefore it is always best to begin with a small quantity, but not less than an ounce, which should be mixed and made into a ball with some mucilage of gum Arabic; and if the horse be not affected with colicky pains, the dose may by degrees be increased to a greater quantity, according to the different age and circumstances." An advantage attending the use of salt-petre is, that it requires no regimen, and gentle exercise will be an advantage.

General practice has so well established the use of antimony as an alternative, that the bare naming of it is sufficient. The liver of antimony is thought to be most efficacious; and in fact it soon brings a shining lustre on the coat, if given to horses in the quantity of from half an ounce to two or three ounces a day, mixed with their corn or other food, or in a ball. Both ways, it should be finely powdered.

Mr. Osmer observes (*f*), that nitre added to antimony will make the mixture a powerful deobstruent, and an efficacious medicine in all diseases befalling horses. If we take two parts of nitre, and one of antimony, first rubbed together, and deffragrate them over a fire, in a crucible, by putting in a little at time, we shall have a medicine nearly analogous to Dr. James's powder; and one or two ounces of it may be given once or twice a day, as occasion may require.

This will be found a very potent remedy in the farcy, in cutaneous diseases, in local swellings, in cases where the circulation is become languid, in a loss of appetite, and many chronical disorders, in which the secretions and excretions stand in need of being promoted.

It is of late become a very frequent practice to add quicksilver to antimony; and perhaps the antimonial æthiops before recommended for the glanders, is the best preparation of them, when intended as an alterative. The other preparations of mercury are too acrid to be given for this purpose, and therefore are judiciously used only a few times in particular disorders, as before directed. Care should be taken that the horse be not exposed to cold when he takes the æthiops, and that it do not affect his mouth. As soon as it is perceived so to do, the use of it should be intermitted for some days, till the horse's mouth gets well, and he can again chew his oats or other food. If this does not happen speedily, flower of sulphur may be given to the quantity of two or three ounces daily, till the mouth becomes as dry as usual.

A rowel may be considered as an alterative medicine, since it is intended to make a gradual

discharge of some noxious humour. The utility of such drains being fully evinced by the experience of ages, I shall not spend time in attempting to account for the effects they produce.

Horses of gross habits, or on whose body, especially limbs, any humour has been deposited by nature, or a humour falls on any part in consequence of a hurt received, are in the case in which most benefit is received by rowels. They are also of service in chronical internal diseases, especially in those of the breast. It is a general rule to make them as near the part affected as may be. They are usually made in the depending part of the horse's belly, that so the matter may have a free discharge. The forepart of the breast, and the neck, are also proper places for them. It is a general rule, never to make them where there is the action or swell of a muscle underneath, lest the irritation on the muscles should bring on an inflammation and its consequences.

Of Hide-bound.

A horse that is hide-bound grows lean, has a feverish heat, his skin sticks to his ribs, the spine becomes harder than usual, small boils break out on his back, and yet his appetite sometimes continues good. As this disorder seldom is an original complaint, but generally arises from some former cause, regard must be had to that cause in the method of cure: though I shall here treat it only as an ill in itself.

Vegetius (g) here directs anointing the whole body with wine and oil well mixed together,

(g) *Lib. III. c. liv.*

rubbing

rubbing them strongly against the hair, in a warm sun, in order that the skin may be relaxed, and a sweat break out; after which the horse should be well covered, and placed in a warm stable, with plenty of litter.

The authors of the *Maison Rustique* advise (b), that the next day after bleeding the horse, a fomentation be made of emollient and aromatic strengthening plants boiled in lees of wine, or beer, and that the whole body of the horse be rubbed with these plants, whilst they are warm, till it is thoroughly wet; and that the loins, belly, and neck, as well as the rest of the body, be anointed with a mixture of one part of honey and three parts of ointment of elder, or populion; rubbing it strongly in with the hand, that it may penetrate the skin. This done, the horse should be covered with a cloth dipt in the warm fomentation, and doubled, and another covering should be put over this, tying it on with one or two surcingles. The horse should remain in this condition twenty-four hours, and then be fomented, rubbed, &c. again, twice. These fomentations being finished, a warm covering must be continued, lest the horse catch cold, and he should then have an opening glyster, and the next morning a purging medicine; continuing to wash his head and neck, and also to rinse his mouth, with the decoction.

“ For food, put into a pail of water about half a bushel of barley-meal coarsly ground, stir it well about, and then let it settle. When the heaviest parts have subsided to the bottom of the pail, pour the thin part off into another pail, for the horse to drink, and give him what remained at the bottom of the first pail, at three

(b) *Tome I. p. 238.*

different times in the day, mixing with it a due quantity of crude antimony. If he refuses to eat it alone, some oats may be mixed with it, in order to accustom him to it; lessening daily the quantity of the oats, till he eats the barley by itself. This should be repeated daily. He must have rest for some time, and be fed with the best hay, or grass, according to the season of the year. In spring, there is nothing better than new grass, especially lucerne; and the quantity should be proportioned to his degree of thriving. In about three weeks, he will begin to mend remarkably; and then he may be returned to his former food. In winter, when there is nothing but hay, it may be sprinkled with water in which honey has been dissolved, in such proportion that he may take from half a pound to a pound of honey each day; and he should likewise take daily at the same time one of the preparations of antimony before directed. Some add sliced liquorice to the hay instead of honey. When the horse begins to drink freely, it is a sign that he is on the recovery."

Of the Surfeit and Mange.

The disease very improperly termed by us a *surfeit*, is a lesser degree of what Vegetius (i) calls the *elephantiasis*, from the resemblance which the horse's skin then bears to the hide of an elephant. The signs of it are, "a burning itch over the whole body, especially in the back; it falls off in scales; inflamed pimples break out in the nostrils, head, and feet; or rough and rugged sores frequently arise. These symptoms are preceded by a looseness;

(i) *Lib. I. c. ix.*

the horse grows lean, has a hard cough, and the mouth and tongue are rough and dry; yet his appetite does not fail him. This disorder generally proves destructive to foals when they are weaned."

Quite similar to the above is also Mr. Bartlet's description of this disease. "A horse, says he (*k*), is said to be surfeited, when his coat stares and looks rusty and dirty, though proper means have not been wanting to keep him clean: the skin is full of scales and dander, that lays thick and mealy among the hair, and is constantly supplied with a fresh succession of the same. Some horses have hurtles of various sizes, like peas or tares: some have dry fixed scabs all over their limbs and bodies; others a moisture, attended with heat and inflammation; the humours being so sharp, and violently itching, that the horses rub so incessantly, as to make themselves raw. Some have no eruptions at all, but an unwholesome look, and are dull, sluggish, and lazy; some appear only hide-bound; others have flying pains and lameness, resembling a rheumatism: so that in the surfeits of horses, we have almost all the different species of the scurvy, and other chronical distempers.

"The wet surfeit (*l*), which is no more than a moist running scurvy, appears on different parts of the body of a horse, attended sometimes with great heat and inflammation; the neck often swells so in one night's time, that great quantities of a hot briny humour issue forth, which, if not allayed, will be apt to collect on the poll or withers, and produce the poll-evil or fistula. This disease also frequently attacks the limbs, where it proves obstinate, and hard to

(*k*) *Gentleman's Farriery*, p. 170.

(*l*) *Id.* p. 173.

cure; and in some horses it shews itself spring and fall."

Of this last kind seems also to be the disease which Vegetius, or at least his translator (*m*), terms the *farcinuous distemper*. In this, the horse's sides and hips, his genitals and especially his joints, together with, frequently, his whole body, are subject to gatherings and swellings; and as fast as they are assuaged or removed, others succeed. The horse takes his meat and drink as usual, but yet grows lean.

He remarks (*n*), that unskilful artists are here in a hurry to take away blood; but that this method is repugnant to the distemper, because it lessens what strength the horse has left. He allows, indeed, that it may be of some service in the beginning, to prevent an increase of the disorder; or in the end, when the horse's strength begins to return; and he directs, that the blood taken away be mixed with vinegar, and the body rubbed with it.

The common practice however is to begin with bleeding, and then to open the body with a purging medicine. — From what has been said of sea-salt, sea-water appears to be here a very proper purge, and should therefore be made use of by those who are within reach of it. They who are not, may dissolve that salt in water, by boiling them together. If it is given warm, the water may then suspend a sufficient quantity, *viz.* two ounces; but if it is suffered to cool, the salt will subside. Glauber salt may be given for the same purpose, with the addition of two drams of jalap to quicken it, and repeated once a week, or as often as necessary. The horse should take daily, either the antimony pre-

(*m*) Book I. c. vii.

(*n*) Lib. I. c. vii.

pared with nitre, or the æthiops mineral; and his food should be green grais, especially lucerne, if the season permits.

If the disorder does not give way to this method, recourse may be had to some mercurial application externally. The most effectual in all cutaneous eruptions is a solution of corrosive sublimate in brandy, a pint of which will suspend half an ounce of the sublimate; and the solution may be weakened by the addition of water, to any degree found necessary; though this will seldom be required. The skin should be quite cleared of scurf and scales before the solution is rubbed on the parts affected. In order to soften scabs or scales which adhere, they should be well anointed with any ointment mixed with flower of brimstone; for this is found to be of singular efficacy in all eruptions.

In a *mangy* horse, the skin is generally thick and full of wrinkles, especially about the mane, the loins, and the tail; and the little hair that remains in those parts stands almost always strait out, or is bristly: the ears are commonly naked and without hair; the eye and eye-brows are the same; and when it affects the limbs, it gives them the same aspect: yet the skin is not raw, nor does it peel off, as in the hot inflamed surfeit (o).

Where this distemper has been caught by infection, it is very easily cured, if taken in time; and I would recommend the sulphur ointment as most effectual for that purpose, rubbed in every day. The way of making it is thus: Take live sulphur, or flowers of the same, half a pound, crude sal ammoniac one ounce, and hogs-lard a sufficient quantity to form into an ointment,

(o) *Bartlet, p. 174.*

To purify the blood, give antimony finely powdered and sulphur, before rubbing, and for some time after; or, in place of that, the æthiops mineral.

When this disorder is owing to poverty of blood, the diet must be mended, and the horse properly indulged with hay and corn.

Nearly a-kin to the foregoing disorders are *mallanders, grease, scratches, crown-scab*, and such like complaints. The remedy for these, says Mr. Osmer (*p*), is warm fomentations applied to the parts; good rubbing of the limbs is also necessary; and a poultice made of rye-meal and milk is a proper application to sore heels. Sometimes, the habit of body requires being altered; in which case, such of the alterative medicines before directed (*q*) as are suited to the disorders, or general temperament of the body, will be found serviceable. In superficial sores discharging an acrid thin ichor, the solution of the sublimate applied to the part, at the removal of the poultices, has sometimes very good effects: and if the fungus has risen high, the knife, or a caustic, is much easier and better than the acid spirits used by farriers.

Mr. Osmer (*r*) instances a very strong proof of the great efficacy of sea-water in cases of this kind, when, speaking from his own observation and inquiry, he assures us, that the horses which are constantly used at Margate, in Kent, to draw people who want to bathe, a little way out into the sea, in a machine contrived for that purpose, and which are accustomed to stand in the salt-water almost every day, for four, five, or six hours together, are sure to be cured of whatsoever ulcers or cutaneous disorders they might

(*p*) Page 185.

(*q*) See *p*.

(*r*) Page 186.

have

have when they first sat about this work; at least in all such parts as the water can reach.

Of the Farcy.

The distinguishing mark of the *Farcy* is a cording of the veins, and the appearance of small tumours in several parts of the body.

Mr. Bartlet (s) deems this distemper easy of cure when it appears on the head only, and especially when it is seated in the cheeks and forehead; because the blood vessels there are small: but he holds it to be more difficult when it affects the lips, the nostrils, the eyes, and the kernels under the jaws, and other soft and loose parts, especially if the neck-vein becomes corded. When the farcy begins on the outside of the shoulder or hip, the cure is seldom difficult: but when it rises on the plate-vein, and that vein swells much and becomes corded, and when the glands or kernels under the arm-pit are affected, it is hard to cure; but still more so when the crural veins in the inside of the thigh are corded, and beset with buds, as they are here called, meaning small tumours, which affect the kernels of the groin, and the cavernous body of the yard. When the farcy begins on the pasterns or lower limbs, it often becomes very uncertain of cure, unless a stop be put to it in time; for the swelling in those dependent parts grows so excessively large in some constitutions, and the limbs are so much disfigured thereby with foul sores and callous ulcerations, that such a horse is seldom afterwards fit for any thing but the meanest drudgery: but is always a promising sign, wherever the farcy happens to be situated, if it spreads no farther,

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It usually affects only one side at a time; but when it passes over to the other, it shews great malignity: when it arises on the spines, it is for the most part dangerous, and is always more so to horses that are fat and full of blood, than to those that are in a moderate case. When the farcy is epidemical, as sometimes happens, it rises on several parts of the body at once, forms nasty foul ulcers, and makes a profuse running of greenish bloody matter from both nostrils; and soon ends in a miserable rot." Mr. Osmer thinks it contagious.

M. Bourgelat says (*t*), that a decoction of the woods, *viz.* guaiacum and sassafras, antimony, powder of vipers, with some mercurial preparations, are looked upon as so many specifics in this disease. He also confirms a fact related in the Philosophical Transactions, that hemlock, when green, or in powder in the winter, will cure it, even when it's bad appearance outwardly seems not to leave any prospect of success. Mr. Markham recommends the roots of the cotton broad white leaved thistle cut in shives, and given with oats, as a remedy that will heal without all fail, if it be given constantly for three weeks.

Mr. Osmer (*u*) advises, that "when swellings fall on any part, which is no uncommon symptom in this disorder, a poultice made with an emollient fomentation, thickened with oatmeal, be applied twice a day; and when the skin breaks, or buds of sprouting flesh appear on any part, such are to be touched with a rag dipt in corrosive spirit of salt, strong spirit of nitre, aqua fortis, or any such kind of medicine."—I cannot help thinking, that a dry caustic, which is more easily kept within bounds, is a better application.

(*t*) 'Ecole Vétérinaire, Matière Médicale, p. 135.

(*u*) Page 185.

Whatever method of cure is followed, it is adviseable to begin with bleeding, and some cooling physic, giving the alterative medicine on the intermediate days. Long practice has given antimony the preference to almost ever other medicine: but perhaps the æthiops mineral is rather more efficacious, as appears by the cases mentioned in the article of Glanders. Sulphur is also recommended to be added to the antimony. Whatever mercurial preparation is administered here, it should be given only as an alterative. Turbith, which Mr. Gibson recommends, is sometimes very violent in it's operations, and what is very remarkable, the dose given makes very little difference in the operation, as six grains will operate on a man as violently as thirty. A physical gentleman, worthy of credit, assures me, that the larger dose is sometimes the mildest in it's operation, especially if given in a bolus with balsam Tolu; and yet, though mild in it's operation, is sometimes very efficacious in the cure of venereal eruptions or ulcers. Whether the same may happen in the farcy, may be a matter of future experiment. Soap, or any alkali, decomposes it, and reduces it to the state of quicksilver.

When, by improper applications, or through neglect, a farcy has spread, increased, and long resisted the medicines above recommended; if fresh buds are continually sprouting forth, while the old ones remain foul and ill-conditioned; if they rise on the spines of the back and loins; if the horse grows hide-bound, and runs at the nose; if abscesses are formed in the fleshy parts between the interstices of the large muscles; if his eyes look dead and lifeless; if he forsakes his food, and scours often, and his excrements appear thin and of a blackish colour;
if

if the plate or thigh-vein continues large and corded after firing, and other proper applications; these symptoms, as Mr. Bartlet very properly remarks (x), denote the distemper to have penetrated internally, and that it will degenerate into an incurable consumption: it is also most probable, that the whole mass of fluids is so vitiated, as to be beyond the power of art to remedy.

Custom has improperly given the name of *water-farcy* to dropical complaints. These may be either an *ascites*, or other water contained in the belly; an *anasarca*, or water contained in the adipose membrane all over the body; or distinct watery tumours in particular parts of the body. In case the water is contained in the belly, Vegetius (y) advises to tap the horse, as is practised on man, and let the water out by a pipe. After the water is drawn off, he directs that some grains of salt be put into the wound, to prevent it's healing up; and that on the second or third day the pipe be again introduced, to draw off the remaining water, till the parts are dry. In the *anasarca*, the back, the sides, and often the whole body, are inflated, as well as the belly. In this case, slight scarifications on the inside of the legs and thighs, and in the skin of the belly, on each side of the sheath, will often carry off that load of water in a speedy and surprising manner. Similar scarifications will also relieve the œdematous swellings in particular parts of the body.

While these operations are performed externally, internal medicines are also necessary, to carry off any remains of the disorder, both by urine and stool. For this purpose, half an ounce

(x) Page 197.

(y) Lib. II. c. xxv.

of jalap well rubbed with an ounce of nitre, and given in a ball, is very proper, and on the intermediate days the following decoction; Take one ounce of nitre, two drams of squills in powder, inner bark of elder and chamomile flowers, of each a handful, and two ounces of juniper-berries; boil them in a quart of water, and give a pint of this night and morning. Vegetius recommends radishes with their leaves to be given as food, because they will both purge and warm the blood. The cure may be completed by giving such things as the following ball and decoction to strengthen the body. Take an ounce of Jesuits bark, and half an ounce of filings of iron, and make them into two balls, to be taken night and morning, drinking after each a pint of the following decoction. Take gentian and zedoary of each half an ounce, chamomile flowers and centaury, of each an handful, of juniper-berries pounded, a handful; boil them in a quantity of water sufficient to yield a quart of strained liquor.

Vegetius (z) speaks of the *Tympany* as a disease incident to horses. The belly of the animal swells like that of one affected with the dropsy, and his neck becomes stiffer than usual; but neither his testicles nor his legs swell. He advises, to anoint the belly with hot ashes and melted suet, to swathe the horse with bandages, and to give him warm drinks in wine and oil.

(z) *Lib. III. c. xxvii.*

S E C T. VIII.

Of Disorders of the Feet.

LAMENESS is often brought on horses by a false step, which, when neglected, renders the ligaments of the nut-bone useless, and the cartilages become ossified. An inflammation from this cause is distinguished by a swelling on the coronet, and a great pain when the finger is pushed against it.

In this case, the best way is to pare the outer side till it becomes thin and flexible, to pare also the crust or hoof down as low as possible, so that every part be thin, even until the foot bleeds, and then to use emollient fomentations and poultices round the foot and coronet, by which means the inflamed parts will be relieved, when the thickness and stricture of the crust has been taken away.

This shews how rightly sportsmen act, when, to prevent the inflammation, and guard against the induration and enlargement of the ligamentous parts, and of the integuments of the fetlock joint, the consequence of repeated violence, they cause the joints of the horse, after hard riding, to be well fomented with flannels dipt in warm water, or a decoction of emollient herbs, and then some warm flannel cloths or rollers to be moderately bound thereon for the ensuing night, and afterwards to be treated as directed for strains.

When any extraneous body, such as a nail, thorn, gravel, &c. has passed into a horse's foot, it should be got out as soon as possible, and the foot should then be covered with a poultice or other mild application: but if it be suspected, from the degree of pain, or discharge of matter, that any thing remains behind, the sole should be
pared

pared as thin as possible, and the hole should be enlarged, that it may be drawn out with a pair of pincers, or be discharged by digestion. If this should not succeed, but the lameness continues, with a discharge of thin, bloody, or stinking matter, the wound must be opened to the bottom, and then dressed with a warm digestive. The same directions should be followed when the foot has been pricked in shoeing.

If the nail penetrates to the joint of the foot, where matter may be formed, and by it's long continuance putrify, so as to erode the cartilages of the joint, the case is incurable: and so it likewise is if the nail has passed up to the nut-bone, because this little bone cannot exfoliate, and the cartilaginous part of it is destroyed the moment it is injured.

If any extraneous body has brought on great inflammation, so that a suppuration must ensue, the sole should be so far opened as to give free vent to the matter; or, if the pain increases, the sole must be drawn; but this should never be without manifest necessity.

A *sand-crack*, as it is called, is a cleft on the outside of the hoof. If it remains a straight line downwards, and penetrates through the boney part of the hoof, it is difficult to cure; but if it passes through the ligament that unites the hoof with the coronet, it is apt to cause a supuration under the hoof, which is very dangerous. When the crack only penetrates the hoof, without touching the ligament, it may easily be cured, by rasping the edges smooth, and then applying a mild digestive: but if there is a hollow under the hoof, the hoof must be rasped away as far as the hollow reaches on all sides.

A *quittor* is an abscess formed between the hair and the hoof, usually on the inside quarter of
of

of a horse's foot. It often arises from treads or bruises, or from gravel lodged about the coronet. If it is superficial, it is easily cured: but if the matter forms itself a lodgment under the hoof, part of the hoof must be taken away. If the quarter of the hoof is taken away, the foot seldom gets quite sound again. If, by the lodgment of the matter, the coffin or foot-bone is injured, the opening must be enlarged, and the flesh destroyed, so that the bone may exfoliate, as before directed in the cure of ulcers with caries. During the cure, the foot should be kept very easy by soft applications; and care should be taken not to suffer the rising of proud flesh, because this would prevent a firm and sound healing.

Mr. Osmer (a) directs, as a proper method of proceeding when the crisis of a fever falls on the feet, on this or any other occasion, to cut them off round and short at the toe, till the blood appears, and with a drawing-knife to score the hoof all round longitudinally, at proper distances, quite to the quick, beginning a little below the coronary ring, and continuing on to the end of the foot or toe; because by this means the new hoof will be the more at liberty to push itself out, and the matter to be discharged. The parts should be dressed with some unctuous medicine, and the whole foot wrapped up with an emollient poultice. By these means, he says, the feet will often become as good and as sound as ever.

He remarks farther on this method of scoring the foot longitudinally, that it is of late come much into practice, with an intent to cure lameness arising from the contracted form of the foot; and that this, together with the horse's being

(a) Page 160.

turned to grass, does in fact expand the foot for a time; but that when these scorings are quite grown out, and the horse is taken to house, the foot so treated soon returns again to it's primitive natural contracted state, and he becomes as lame as he was before.

When, in consequence of great inflammation, tending to suppuration, it is absolutely necessary to draw the sole, as is sometimes the case, the foot should be suffered to bleed: or if the sole be so loosened by an imposthumation as to fall off from the bone, in either of these cases, on the removal of the hoof, a boot of leather, with a strong sole, should be laced about the pastern, bolstering the foot with soft flax, that the tread may be easy. The fungus is to be kept down, and the cure to be completed as already directed.

S E C T. IX.

Of Venomous Bites.

I CANNOT here do better than quote what may relate to this subject, from the learned Dr. Mead's Treatise on the bite of a mad dog. (a)

"I am of opinion, says that great physician, that the wound should be enlarged, and dressed with black basilicon, adding thereto a small quantity of red precipitate as a digestive; for it may be of advantage to have a drain continued from the part.

"There are two or three internal remedies recommended I think upon rational grounds. The

(a) *The Medical Works of Dr. Richard Mead*, 4to edit. 1762, page 86.

first is, the ashes of the river craw-fish. These were prepared by burning the fish alive upon a copper-plate, with a fire made of the cuttings of twigs of the white briony. A large spoonful or two of the calcined powder was given every day for forty days together, either alone, or mixed with a small portion of gentian root and frankincense.

“ Another medicine is the sponge of the dog-rose, which is celebrated as an antidote against this and other animal poisons. The plant *alyssum*, or madwort, had it's name given it by the antients, from it's great efficacy against this madness. To them may be added garlic, agrimony, and oxylapathum.

“ Now it is remarkable that all these remedies are powerful diuretics, and the surest remedies in all ages against this venom have been such as provoke a great discharge by urine. Reflecting upon this, I thought it might be right to give to the public a course easily to be pursued, which, by preventing the fever for a long time after the bite, and constantly provoking this evacuation, might secure the patient from danger. The method is this :

“ Let the patient [we will here suppose the horse] be blooded plentifully. Take of the herb ash-coloured ground liverwort (*lichen cinereus terrestris*) cleaned, dried, and powdered, two ounces (half an ounce for a man), and of black pepper powdered an ounce; mix these well together, and divide the powder into four doses, one of which must be taken every morning fasting, for four mornings successively, in half a pint of cow's milk warm. After these four doses are taken, the horse must be plunged into cold water every morning fasting for a month. After this he must be put in three times

times a week for a fortnight longer. Salt water, where it can be conveniently come at, is preferred for the purpose of bathing."

The following mercurial method having been found successful both in dogs and men, Mr. Bartlet, with very great propriety, recommends it for horses, and indeed thinks it more to be depended on than most others. Dr. James's account of it to the Royal Society, from which Mr. Bartlet's is borrowed, is to the following effect (a).

"About michaelmas 1731, Mr. Floyer, of Hampshire, complained to Dr. James, that he was afraid of a madness among his fox-hounds; for that morning one had run mad in his kennel: upon which the doctor told him, he had believed that mercury would, if tried, prove the best remedy against this infection. Mr. Floyer neglected this advice till the February following; and in the mean time tried the medicine in Bates's Dispensary, commonly known by the name of the pewter-medicine, as also every thing else that was recommended to him by other sportsmen, but to no purpose; for some of his hounds ran mad almost every day after hunting. Upon this he took his hounds to the sea, and had every one of them dipt in the salt water; and at his return he carried his dogs to another gentleman's kennel, six miles distant from his own. Yet, notwithstanding this precaution, he lost six or seven couple of dogs in a fortnight's time. At length, in February, Mr. Floyer tried the experiment which the doctor had recommended, upon two hounds that were mad, and both very far gone. They refused food of all sorts, particularly fluids, flavered much, and had all the symptoms of a

(a) *Bartlet, p. 318, and Philosophical Transactions, No.*

hydrophobia to a great degree; that night he gave to each of the two dogs twelve grains of turpeth mineral, which vomited and purged them gently: twenty-four hours after this, he gave to each of them twenty-four grains; and after the same interval, he gave forty-eight more to each: the dogs salivated very much, and soon after lapped warm milk: at the end of twenty-four hours more, he repeated to one dog twenty-four grains more, and omitted it to the other; the dog that took this last dose, lay upon the ground, salivated extremely, was in great agonies, and had all the symptoms of a salivation raised too high; but got through it: the other relapsed and died.

“ To all the rest of the pack he gave seven grains of turpeth for the first dose, twelve for the second dose, at twenty-four hours distance, which was repeated every other day for some little time. The method was repeated at the two or three succeeding fulls and changes of the moon: from this time he lost not another hound; and though several afterwards were bit by strange dogs, the turpeth always prevented any ill consequences.

“ The doctor and his friends tried the same thing upon a great many dogs, and it never failed in any one instance; though dogs bit at the same time, and by the same dogs, ran mad, after most other medicines had been tried.”

The same method may very properly, as Mr. Bartlet observes, be practised in giving this medicine to a horse, only increasing the quantity to two scruples, or half a drachm each dose.

The following recipe has long been in great esteem, and is thought by some to be an infallible cure for the bite of a mad dog. Indeed it cannot but be of service in all venomous bites.

“ Take

"Take six ounces of rue; Venice treacle, garlic, and tin scraped, of each four ounces; boil them in two quarts of ale over a gentle fire to the consumption of half; strain the liquor off from the ingredients, and give the horse four or five ounces of it every morning fasting."

The ingredients may be beaten together in a mortar, and applied daily to the wound as a poultice.

Horses, when feeding or lying down, may offend poisonous creatures, and are therefore liable to be bit or stung by them. Of these the viper is the most frequent in this country, and that whose bite is the most dangerous. Whatever will cure it's bite, will therefore cure any less venomous one. For this reason, I shall here again take Dr. Mead for my guide. That excellent physician lays great stress on sucking the wound; but that cannot well be done in a horse. The cupping-glass seems the next succedaneum; though the doctor seems to hint that the spittle has some share in the cure; and remarks, that whoever sucks the wound, ought to wash his mouth well before-hand with warm oil, and hold some of this in his mouth while the suction is performing, to prevent any inflammation of the lips and tongue by the heat of the poison.

"To confirm this practice," continues the doctor, "I have been assured by an ingenious surgeon, who lived in Virginia, that the Indians there cure the bite of the rattle-snake by sucking the wound, and taking immediately a large quantity of a decoction of Seneca rattle-snake root, which vomits plentifully, and laying to the part the same root chewed.

"As to any other external management, I think it can avail but little; since it cannot prevent the sudden communication of the poison to

the nerves. Burning the part with a hot iron is of no use. Dry salt upon the wound, recommended by Celsus, promises somewhat more; and not much more is to be said of the remedy of our viper-catchers, in which they place so much confidence, as to be no more afraid of a bite than of a common puncture. This is no other than the *expungia viperina* (fat of vipers) rubbed into the wound;—of the good effects of which he, however, then gives some instances.—Some writers conclude, that the efficacy of this application arises only from it's unctuous quality, and that therefore oil will have the effect. I do not know that this has yet been sufficiently ascertained: but when there is no viper's fat at hand, it is surely worth trial.

Dr. Mead adds (c), that if the patient [read here the horse] be faint and otherwise disordered, he should be wrapped up warm, and made to take some cordial medicines, particularly about an ounce of Raleigh's confection, and a drachm of salt of vipers, or for want of this, of salt of hartshorn, given in warm wine. A very good remedy in this case likewise is, as Mr. Bartlet advises (d), where it can be afforded for a horse, half an ounce of musk, and as much cinnabar, so strongly recommended in bites of poisonous animals.

Vegetius (e) gives the following signs of a horse's having been wounded by a poisonous animal. He loaths his food, drags his feet, and when brought forth, he lies or falls down at every step, a corrupted matter flows from his nostrils, there is a weight and heaviness in his head, so that he hangs it down to the ground, and the strength of his whole body fails, cor-

(c) Page 46. (d) Page 317. (e) Lib. III. c. lxxvii.

rupted matter issues out of the wound, and if the viper be pregnant, the horse's whole body breaks out, and swells so as to be like to burst.

The use of oil externally, in cases of this kind, was well known to the antients, and certainly is very right.

Horses, in drinking, sometimes swallow leeches, which may fasten on the fauces, or in the æsophagus, so as to be out of reach; and in this case it is advised to pour warm oil down the throat, as a means of making them quit their hold. They may also swallow spiders in their hay, or other venomous creatures, hen's dung, &c. which, Vegetius says (*f*), will soon occasion great pain in the inward parts, an inflammation of the belly, a tumbling with violent gripes, and a harsh cough. To remedy this, he directs, to bruise two ounces of parsley-seed, and mix it with a pint of old wine and half a pint of honey, to be poured down the horse's throat; afterwards walking him gently about till this moves his belly. If the violence of the pain should occasion a swelling in any part of the body, or a stiffness of the joints and limbs, take a pound of bayberries, half a pound of nitre, a quart of vinegar, and a pint of oil, mix and warm them upon the fire, and anoint him with it in a warm place, rubbing him heartily against the hair. This, repeated for three days, will, by making him sweat, certainly cure him, says Vegetius.

(e) *Lib. III. c. lxxxv.*

S E C T. X.

Of the Arthritis

VEGETIUS (a) gives the following description of a disease in horses similar to the *rheumatism* in men. The horse will be lame in his joints, as if he had received some injury on them, with this difference, that a hurt is fixed to a place, but in this ailment he will be lame sometimes in his fore, and sometimes in his hind-feet, the coronets and knees will be sometimes swelled, or the skin be bound fast to the bones, the spine becomes stiff, his hair stands on end, and he grows careless of his food.

He orders, "that blood be taken away from the neck, then thoroughly mixed with very sharp vinegar, and the horse's body, especially where the pain is, to be well rubbed therewith. Blood should also be taken from the veins nearest to the parts affected, and this, after being mixed with vinegar, cummin-seed, salt, &c. is also to be rubbed wherever there appears a tumour. Then take centaury, wormwood, sow-fennel, mother of thyme, betony, saxifrage, round birthwort, and faggapen, of each equal quantities, which reduce to powder. Give a large spoonful of the powder every day in a draught of warm water, if the horse is feverish, or in a pint of wine if he is free from a fever."

He likewise describes a distemper which he thinks analagous to the *gout* in man (b.) "The horse, in this case, can neither stand nor walk,

(a) *Lib. I. c. vi. b. xiii.*(b) *Lib. II. c. viii.*

and if he is compelled to move, he hobbles, and often throws himself down. By reason of this pain he does not digest his food, and therefore becomes ill-favoured; his body will be hot, his veins swelled, his yard hanging down, and his dung will stick to his feet, because of his too-great heat.—He orders repeated bleedings in small quantities, and gentle exercise in a dry place till the horse sweats, and rubbing. Let his drink be warm water mixed with powdered nitre and wheat-meal: let him be purged, to carry off the noxious humours; and give him green grass for his food, or, if this be wanting, hay sprinkled with nitre. Give him also an infusion of the flower of frankincense in wine, half a pint for three mornings running. If none of these things are of benefit to him, let him be gelded, and he will be free from his distemper, for the gout seldom afflicts eunuchs.”

S E C T. XI.

Of Gelding.

I Place this operation here, because the performing of it generally falls to the lot of the farrier or horse-doctor. It is attended with very little danger whilst horses are young. The legs of the creature intended to be castrated are tied with ropes, he is then thrown on his back, and the scrotum, or purse, is opened lengthwise with an incision-knife, so that the spermatic cord or vessels are laid bare. The testicles being then turned out, a thread well waxed, and pressed a little flattish, that it may not cut through, is

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tied round the spermatic cord, and the testicle is cut off, leaving about a quarter of an inch of the cord below the ligature. The whole is then dressed up with dry lint, and over all is put a large pledget of tow covered with any ointment, that the scrotum may remain in a soft and easy situation. If no accident happens, it need not be looked at till the third or fourth day, when the fore will be digested, and it should then be dressed every day till the ligature falls off, after which it is to be cured as a common wound. In old stallions this operation is sometimes attended with inflammation, &c. in which case it is to be treated as before directed for an inflammatory wound. 'Twere needless to observe, that the horse should be kept on a cooling diet during the whole of this time.

The most proper seasons for performing this operation are spring and autumn; great heat and great cold being equally unfavourable: and with regard to age, in some countries horses are castrated when they are not above a year, or eighteen months old, or as soon as the testicles are clearly discernible on the outside; but the most general practice is, not to castrate them till they are two, or even three years old, and this some think the most judicious way, because the later they are castrated, the more they retain of the masculine qualities; for it is certain that this operation diminishes considerably their strength, spirit, and courage: but on the other hand they derive from it mildness, docility, and tractableness.

The Persians, Arabians, and several other nations of the East, never castrate their horses: but geldings are as common in China as they are in Europe.

S E C T.

S E C T. XII.

Of Shoeing.

THIS being also a part of the farrier's business, it may not be improper to observe here, that, as the only intention in shoeing horses is to add strength to the hoof, and to prevent it's being worn away by stones, grit, &c. especially upon hard roads, it is sufficient that the shoe be wide enough to defend the horny part, or rim of the hoof, beyond which it should not project, and to admit of being fastened on firmly with proper nails. By this means, there being no hollow between the shoe and the hoof, the horse will be less apt to pick up stones than he is with the broad shoes generally used. Care should also be taken not to pare away any more of the hoof than what is ragged and damaged, and consequently always to leave a sufficient breadth for the nails to go into without pricking the quick; an accident by which numbers of horses are lamed, and sometimes inflammations are brought on, which separate the whole hoof from the foot, just as a whitlow will take the nail off from a finger or toe. For these instructions I am indebted to an eminent officer of our cavalry, all the horses of whose regiment are shod upon the above principles.

B O O K II.

O F A S S E S.

FAR from deserving the contempt in which he is generally held, the *Ass* is, in fact, one of the most necessary animals about a farm-house: he costs hardly any thing to keep, and does a great deal of work, such as carrying corn to the mill, provisions to the market, or to labourers in the field, with numberless other useful offices; for, in proportion to his size, he will carry a heavier load than perhaps any other animal. In some countries too he is made to till the ground where the soil is light, to draw a cart, and even to serve instead of a horse for riding post: nor is there any more easy going, or surer-footed creature. The milk of the female is an excellent medicine to man, particularly in consumptive and gouty cases; and the skin of these animals is rendered serviceable and profitable, after they are dead; for of it, being very hard and very elastic, are made drums, sieves, &c. The merit of the ass's-skin pocket-books is well known; and in many parts the peasants make good strong shoes of the tanned skin of the ass's back. It is also with the hinder part of the ass's skin that the Orientals make the *Sagri* (a), which we call Sha-

(a) See *Thevenot's Travels*, Tom. II. p. 64.

green †. The dung of asses is an excellent manure for strong or moist lands,

Is it then, as M. de Buffon compassionately asks on this occasion (c), that men extend their contempt of those who serve them too well and too cheaply, even to animals? The horse, continues he, is trained up, great care is taken of him, he is instructed and exercised; whilst the poor ass, left to the brutality of the meanest servant and the wantonness of children, instead of improving, cannot but be a loser by his education. Most certainly, if he had not a large fund of good qualities, the manner in which he is treated would be sufficient to exhaust them all. He is the sport, the butt, the drudge of clowns, who, without the least thought or concern, drive him along with a cudgel, beating, over-loading, and tiring him. It is not remembered, that the ass would be, both in himself and for us, the most useful, most beautiful, and most distinguished of animals, if there were no horse in the world: he is the second, instead of being the first, and for that alone he is looked upon as nothing: it is the comparison that degrades him: he is considered, he is judged of, not in himself, but relatively to the horse: we forget that he is an ass; that he has all the qualities of his nature, all the gifts annexed to his species, and think only on the figure and qualities of the horse, which are wanting in him, and which he could not have without ceasing to be an ass.

By his natural temper he is as humble, as patient, and as quiet, as the horse is proud, fiery, and impetuous: he bears with firmness, and

† The best is made with the skin that covers the rump and buttocks of the wild ass. It is prepared in Syria, and comes to us from Constantinople.

(c) *Histoire Naturelle de l'Asie.*

perhaps with courage, blows and chastisements : he is sober, both with regard to the quantity, and the quality of his food, contenting himself with the hardest and most disagreeable herbs, which the horse and other animals disdain to touch. In water, indeed, he is very nice, drinking only of that which is perfectly clear, and at brooks he is acquainted with : he is as temperate in his drinking as in his eating, and does not plunge his nose into the water, from a fear, as is said (*d*), of seeing the shadow of his ears ; and to this also some, with great seeming reason, impute his being less subject to the glanders than the horse, as was before observed in treating of that animal *. As no one bestows upon him the pains of currying, he often rolls himself on the grass, on thistles, or on fern ; and, without minding his load, he lies down to roll as often as he has an opportunity, as if to reproach his master with the little care taken of him ; for he

(*d*) *Cardanus, de Subtilitate, l. x.*

* Quadrupeds do not drink in the same manner, though all are under the like necessity of stooping their heads to the water, because they cannot otherwise reach it ; the monkey and some few others excepted, which, having hands, can drink like a man out of a vessel given them ; for they put it to their mouth, and, inclining the vessel, pour out the liquor, which they swallow merely by the motion of deglutition. The dog, the aperture of whose mouth is very large, and furnished with a long and slender tongue, drinks by lapping ; that is, licking up the water, and forming with his tongue a cup, which being filled every time, brings up a pretty large quantity of liquor : this method he prefers to that of wetting his nose : whereas the horse, having a less mouth, and his tongue too thick and short to form a large cup, and which, besides, drinks eagerly, thrusts his nose to some depth into the water, which he thus swallows plentifully by the simple motion of deglutition. But this very circumstance obliges him to drink all at a breath ; whereas the dog breathes freely all the time he drinks ; and so does likewise the ass, who only just touches the water with his lips.

does

does not welter like the horse in mud and water; but is cautious even of wetting his feet, and turns aside to avoid any dirt: accordingly, his legs are drier and more cleanly than those of the horse. He is susceptible of education †, and some have been trained in such a manner as to be shewn for a curiosity (g). Regular currying and rubbing down would undoubtedly much improve the look of the ass, and be of service to it's health.

In his early youth, he is sprightly, and not void of prettiness, agility, and good humour; but he soon loses these good qualities, either through age or ill treatment, and becomes sluggish, untractable, and obstinate; eager only for pleasure, or rather so mad after it, that nothing can restrain him; nay, some have been known to be so violent, as to die within a few minutes after copulation; and as his love is a kind of frenzy, so he has also the strongest affection for his issue. Pliny assures us, that if the dam be separated from her foal, she will rush through flames of fire to rejoin it. The ass is also fond of his master, though generally ill-treated by him: he smells him at a great distance, and distinguishes him from every other man: he likewise knows again the places where he has been used to live, and the roads which

† In Persia they are taught to amble; to which purpose the fore and hind legs of the same side are tied together with cotton lines, at a greater or less distance asunder, according to the step the creature is to make in ambling. These lines are fastened to the girth at the place of the stirrup: a sort of grooms ride them morning and evening, and habituate them to this pace. Their nostrils are split to give them the more wind, and they go at such a rate that there is no keeping up with them but on a gallop. *Voyages des Cheux. Chardin, Tom. II. p. 26, 27.*

(g) *Aldrovand. de Quadruped. soliped. lib. I. p. 308.*

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he has travelled. His sight is strong, and his smell is surprizingly quick, especially with regard to the effluvia of the she-afs: he is very quick of hearing, which has contributed to his having been ranked among the timid animals, who are all said to be very quick of hearing, and to have long ears. When overloaded, he hangs down his head and drops his ears; when too much vexed, he opens his mouth and draws back his lips in a very disagreeable manner, which gives him a sneering and derisory aspect. If his eyes are covered, he stands motionless; and when lying on his side, if his head is placed in such manner that one eye rests on the ground, and the other eye be covered with a stone, or piece of wood, he will continue in that posture without shaking himself, or attempting to rise. Like the horse, he walks, trots, and gallops; but all his motions are short, and much slower: though he may run at first with some swiftness, he can do so but for a little way and a short time; and whatever pace he takes, he soon gives over, if hurried.

The horse neighs, and the afs brays, which last is done by a very long and highly disagreeable and discordant cry through alternate dissonances, from the grave to the acute, and from the acute to the grave. He hardly ever makes this noise but when stimulated by lust or by hunger. The voice of the she-afs is clearer and shriller than that of the male. A castrated afs brays but weakly; and though he seems to make the same efforts, and has the same motions with the throat, his cry does not reach to any great distance*.

Of

* That judicious investigator of the works of nature, M. de Buffon, thinks it a rule without exception, that, in all

Of all hairy animals, the afs is the leaft subject to vermin: he is never troubled with lice, probably owing to the hardnefs and drynefs of his fkin, which is indeed harder than that of moft other quadrupeds; and this alfo renders him lefs fenfible than the horfe, to the whip, and the ftinging of flies.

At the end of two years and a half the afs fheds his foal-teeth, and next the other incifories, which drop out, and are renewed in the fame order as thofe of the horfe. The age of an afs is alfo known by the teeth; and the third of the incifories, on each fide, is denoted as in the horfe.

The afs is capable of generating fo early as at the age of two years: the female is even fooner ripe than the male, and full as lafcivious; for which reafon fhe is a bad breeder, ejefting again the feminal fluid fhe had juft received in coition, unlefs the fenfation of pleafure be immediately removed by loading her with blows; the only method of preventing the confequences of her amorous convulfions. This is a precaution without which they would very feldom retain. The moft ufual times of her heat are in the months of

all quadruped animals, the voice of the male is ftronger and deeper than that of the female; though fome of the antients tell us, that the cow, the ox, and even the calf, have a deeper voice than the bull. Certain it is, that the bull has a far ftronger voice, as being heard to a much greater diftance than either of them; and what gave rife to a belief of his voice being lefs deep probably was his manner of lowing, which is not a fimple found, but compofed of two or three octaves, the laft of which moft affects the ear; and if we liften to it, we fhall perceive a found more hollow than that of the ox, the cow, or the calf, whole lowings are alfo much fhorter. It is love only that caufes the bull to low; the cow oftener lows from fear than love; and when the calf lows, it is from grief, hunger, or a defire to be with it's mother.

May

May and June. After pregnancy, her heat is soon over, and in the tenth month the milk appears in her teats. In the twelfth month she foals; and seven days after parturition the heat returns, and she is again fit to receive the male; so that she may, as it were, be kept continually engendering and nourishing her young. There is hardly an instance of her having two foals at a time. At the end of five or six months the foal may be weaned; and 'tis even necessary that it should, if the dam be pregnant, in order that the foetus may have proper nourishment. At the age of three years he should be accustomed to work, and it will be right then to shoe him with a light shoe, particularly to guard the fore part of his hoof.

To have good afs's milk for medicinal uses, the she-afs must be found, in good case, and one that has foaled lately, and not been covered since. The foal that she then suckles must be taken from her; she must be kept clean, and fed with hay, oats, barley, and herbs whose salubrious qualities are adapted to the disease. This milk must not be suffered to grow cold, nor should it even be exposed to the open air, because in either of these cases it soon spoils.

A stallion afs should be chosen from among the largest and strongest of his species. He should be at least three years old, and not exceed ten. His legs should be long, his body full, his head erect and airy, his eye lively, his nostrils large, his neck longish, his breast broad, his back fleshy, his ribs broad, his rump flat, his tail short, and his pile glossy, soft, and of a dark grey. The most common colour in asses is the mouse grey; but there are also glossy greys, and grey mixed with dark spots, as well
as

as some of a dun colour, some brown, and others black.

There are different breeds amongst asses, as well as amongst horses; but the former are less known, because they have been least attended to. That they all came originally from hot climates, is a fact scarcely to be doubted. Aristotle (*i*) assures us, that in his time there were no asses in Scythia, nor even in Gaul, where, he says, the climate is somewhat cold: to which he adds, that a cold climate disables them from propagating their species, or causes them to degenerate: and we have Linnæus's testimony (*k*) that they have not been long known in Sweden*. In fact, they seem originally to have come from Arabia, and thence to have passed into Egypt, from Egypt into Greece, from Greece into Italy, from Italy into Spain and France, and afterwards into Germany, England, and lastly into Sweden, &c. in all which countries it is to be observed, that the colder the climate is, the weaker and smaller the asses are.

The Spanish asses are by far the finest of any now in Europe. The climate, and the care that is taken of them, render them such: for, undoubtedly on account of the badness of their roads and the sure-footedness of these creatures, the Spaniards, who make great use of them and of mules for travelling, feed and treat them

(i) *De Generat. Animal. Lib. II.*

(k) *Fauna Suæca.*

(l) Neither asses nor horses were found in America when the Spaniards first discovered that country, though the climate, especially that of the southern parts, agrees with them as well as any other. Those carried over thither by the Spaniards, and turned loose in the large islands, and on the continent, have increased so considerably, that in several places wild asses are seen in troops, and they are taken in toils, like wild horses.

T

well,

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well, and thereby render them beyond compare more gentle, active, and docile than they are with us. So great is the estimation in which they hold these animals, that a large stout he-ass frequently sells for sixty guineas on the spot; and if it be suspected that he is to be carried out of the country, he will not be parted with for less than an hundred. In Auvergne too, where indeed the cold is felt as much as in any province of France, they have large and high-priced asses; and as they thrive as well, work as hard, and live as long in all parts of this island as they do in any other country whatever, it cannot be doubted that they would likewise do as well here in all respects, with proper management. The present goodness of our roads in general, and the great plenty we have of all sorts of horses, may indeed, in some measure, account for our neglect of asses: but do we not carry that neglect too far? A little attention might perhaps discover purposes for which these animals are peculiarly proper; such as their travelling safely over high and stony mountains, passing securely through narrow winding paths in mines, and in the working of machines, for which they seem perfectly qualified by their natural steadiness.

The ass, which, like the horse, requires three or four years to attain it's full growth, lives also, like that animal, twenty-five or thirty years: but the females are generally said to be longer lived than the males: a consequence, perhaps, of their being a little more tenderly used, on account of their being often pregnant; whereas the males are worked and beaten without intermission.

Asses sleep less than horses; and if ever they lie down to sleep, it is only when they are quite spent with labour. The stallion ass also lasts longer

longer than the stallion horse: his eagerness seems to increase with his age; and in general the health of this animal is much more steady and confirmed than that of the horse. He is far more hardy, and subject to a much less number of diseases. Even the antients mention few, except the glanders, and this is very rare. As to the rest, the diseases of these animals are to be treated in the same manner as those of horses.

B O O K III.

Of M U L E S.

THE Mule is a beast of burden, begot by a male afs and a mare, or by a stallion horse and a female afs. There are both male and female mules, and both of them are very eager for copulation; but they do not breed, at least, in climates like this. Some think it is because they proceed from two different species of animals: but others say positively that they do breed in hot countries*. In France, where many mules are bred, they are not suffered to couple, because that renders them vicious and spiteful.

* All animals which owe their origin to creatures of different species are generally termed *mules*, and accounted barren: but, though it does not appear that mules proceeding from the afs and mare, or from a stallion-horse with a she-afs, produce any thing either among themselves, or with those from whom they are derived; yet, as M. de Buffon observes, in his Natural History of the Goat, this opinion is perhaps ill-founded: for the antients positively assert that the mule is able to procreate at seven years, and that he does actually procreate with the mare (*a*). They also tell us, that a mule is capable of conception, though it never brings it's fruit to maturity (*b*). These things, which throw a veil of

(a) *Mulus septennis implere potest, et jam cum equâ conjunctus binnum procreavit.* Arist. Hist. Animal. Lib. VI, cap. xxiv.

(b) *Itaque concipere quidem aliquando mula potest, quod jam factum est; sed enutrire atque in finem perducere non potest. Mas generare interdum potest.* Arist. de Generat. Animal. Lib. II, cap. vi.

Mules live a long while, often above thirty years: they are very healthy, and partake of the qualities of the animals from which they proceed; that is to say, they have the strength of the horse and the hardiness of the ass. They seem born for carrying heavy burthens, for carrying them gently, and for lasting a long time. They hardly ever stumble: their sense of smelling is uncommonly quick: they are very fantastical, and apt to kick, and their obstinacy is become proverbial. We know not of any wild ones.

In Spain, almost all the carriages are drawn by mules; they carry the baggage and equipages of princes and officers, and are of excellent service particularly in mountainous places. Traders and millers use them there to carry their merchandize and their corn; they are even made to plow the ground, and to thrash the corn by treading it out. They are also much used in

darkness over the real distinction between animals and the theory of generation, should therefore either be confuted or confirmed. Besides, had we ever so clear a knowledge of all the species of animals around us, yet we know not what a mixture between themselves, or with foreign animals would produce. We are, continues this judicious writer, but little acquainted with the *jumar*, that is, the produce of the cow and the ass, or the mare and the bull. We know not whether the zebra would not copulate with the horse or the ass: whether the thick tailed creature known by the name of the Barbary ram would not produce with our ewe: whether the chamois be not a species of wild goat; whether it would not with our goat form some intermediate breed: whether monkeys differ in real species, or whether, like dogs, they are all of one and the same species, but varied by a number of different breeds; whether the dog can produce with the fox and the wolf; whether the stag produces with the cow, the hind with the buck, &c. Our ignorance, with regard to all these facts, is almost invincible; the experiments by which alone they can be decided, requiring more time, and more attention and expence, than the life and fortune of a common person will admit of.

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Italy; and in Auvergne they are employed for every thing that is usually done elsewhere by horses and oxen, of which there are but few in that province of France. They form a part of the parade of great personages abroad when they make their public entries; and it is not long since the magistrates in France rode upon mules to their courts of justice, and physicians to visit their patients. The Flemings used formerly to breed from their large-sized mares considerable numbers of very stately mules, some of them sixteen and some seventeen hands high, and they were very serviceable as sumpter-mules in the army: but since the Low-Countries have ceased to bear the Spanish yoke, they breed fewer mules. They were also much more common in this country in former times than they are at present, being often brought over hither in the days of popery by the Italian prelates. They continued longest here in the service of millers, and are yet in use among them in some places, on account of the great loads they are able to carry. We also send some to our American colonies, where they are much used and esteemed, particularly in the islands. Poitou, and the Mirebalais in France still continue to breed great numbers of mules, but Auvergne yet more, and these last are most esteemed*.

* The Spaniards have long had such a predilection for mules, that it raised the price of the asses to the high degree before mentioned (p. 274), and produced an absolute prohibition of exportation. It has also lessened their regard and attention to horses; insomuch that the studs in Andalusia, formerly esteemed the finest in Europe, have lost their credit, and future ages will hardly credit what has been truly said of Spanish horses. To remedy this, the government have more than once thought of restricting the use of mules to ecclesiastics and women.

To have handsome and good mules, the stallion-afs should be in his full vigour, and therefore above three years old, and not more than ten; he should be of a good breed; for in the studs of mules, which are not uncommon in foreign countries, a stallion-afs of a good breed is worth sixty or seventy pounds, whereas a middling one will not fetch above eleven or twelve: he should be well made, that is to say, large sized, with a stout thick neck, strong and broad ribs, an open and muscular chest, fleshy thighs, tight-made legs, and above all well provided in his genitals, as those of the Mirebalais are remarkably. As to the colour, the plain black or black speckled with a rather lively red, or the silver-grey, or grey intermixed with dark spots, are the most esteemed: the mouse-grey, which is the most common colour of asses, should be rejected.

The mares should be under ten years of age, and as near as can be of the same colour as the stallion, especially when one desires to have black mules, which are the most esteemed. In the year 1689, it was enacted in France, that no stallion-afs should be given to a mare under fourteen hands high, which is tall enough to produce the finest mules; and the large full-bodied mares in that country are reserved for the multiplication of this breed.

The stallion-afs becomes so furious at the sight of the mare intended for him, that he must always be kept muzzled at that time, lest he should maim the grooms who lead her to him.

It generally is from the middle of March to the middle of June that the afs is given to the mares, in order that, as they go eleven or twelve months, the mules may be born at a time when there is plenty of good succulent grass, fit for the dam and her young one. The afs should be

rested for a week before he covers the mare, and during that time he should have oats once a day, and be fed with good hay. As to the rest, what was before said concerning studs for horses, is equally applicable to the breeding of mules; with this only difference, that mares which have been covered by a stallion-afs go a whole year, and that they cannot suckle their young ones above six months, on account of a pain they have in their teats after that time. These mule-colts must therefore be weaned at that time, or made to suck another mare.

The mules begot by an afs and a mare are better and handsomer than those which come from a she-afs covered by a stone-horse; they are even two different kinds. Also, the male mules are stronger than the female, and therefore preferred for labour and long journies.

A good male mule should have round and thickish legs, little belly, the body firm, and the rump hanging down towards the tail. The female should also be full bodied, but with small feet and dry legs, well-spread buttocks, a wide chest, a long and arched neck, and a small lean head.

The age of mules, both male and female, is known by their teeth, in the same manner as that of horses. Many judge of the height they will be of by the length of their legs: at three months the legs have attained their full growth, and they are then half the height of the mule.

When three years old, they are broken and trained like colts; but much greater patience is required here, because they are much more head-strong and fantastical. Wine is said to familiarize them; and one of their feet is tied up to their thigh to prevent the kicking, and at the same time render them docile. They kick only with
their

their hind legs. Many do not use them for work till they are five years old.

They are fed and managed in the same manner as horses, and are subject to the same diseases; consequently the methods of cure before pointed out for the latter, are likewise to be resorted to for these animals. The *Maison Rustique*, from whence I have borrowed the greatest part of this article, M. de Buffon not having any where professedly spoken of the mule, says, (c) in addition to the treatment of their diseases, that a pint of red wine, in which half an ounce of flour of brimstone, a raw egg, and a drachm of myrrh have been mixed, will, if given repeatedly for some time, in case of their growing lean, restore them to their flesh and good appearance; and also, that the same remedy will cure them of gripes and coughs.

(c) *Tom. I, Part I, Liv. III, chap, iii.*

B O O K IV.

O F H O R N E D C A T T L E.

C H A P. I.

Of the general Properties and Uses of Horned Cattle.

THE Ox is the most valuable of horned cattle: he costs but little to keep, and yields a considerable profit; is very good for draught, and for the plough; subject to few diseases, and those easily cured: he lives to a good age, and requires but a trifle to harness him, though no creature turns up the earth so well; and when he is worn out with service, he is fattened, and becomes excellent food; or, if he breaks a limb he is killed, and his flesh is eaten. His skin and his suet sell for a good price: even his horns and his gall fetch somewhat, and his dung is a good manure: in short, he may justly be stiled, by way of excellence, *the animal*; for, besides the great services which he renders to man, he returns to the earth full as much as he takes from it, even meliorates the soil on which he lives, and fattens his pastures; whereas the horse, and most other animals, exhaust the richest meadows in a few years. Without the ox, both rich and poor would

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would find it difficult to subsist; the earth would lie uncultivated; our fields, and even our gardens, would be dry and barren. He is a principal instrument in all works of husbandry, the most useful servant in a farm, and the support of rural œconomics; for on him depends the most laborious part of agriculture.

Formerly the wealth of man consisted chiefly in his herds of black cattle, and they still continue to be the basis of national opulence; for it is only by the cultivation of lands, and the abundance of cattle, that a state can be maintained in a flourishing condition. These are, alone, real goods: all others, gold and silver not excepted, are only arbitrary; money and credit having no other value than what they derive from the products of the earth.

That the ox is not so proper for carrying burdens as the horse, the ass, the mule, the camel, and some other beasts, is evident, from the form of his back and reins: but his thick neck and broad shoulders declare him to be perfectly fit for draught; and accordingly it is with them that he draws to the greatest advantage, though such is the absurdity of some men, and such their blind attachment even to the most ridiculous customs, that he still is, in many parts, and particularly in several of the provinces of France, made to draw by his horns, on the shallow pretence of his being then most easily guided:—A custom almost as preposterous as was that of the Irish, who, till lately, used to make their horses draw the plough by their tails. It may indeed be true, that the strength of the ox's head is sufficient to enable him to bear tolerably well this method of labouring: but certainly he performs his work much less easily, and less well, than when he draws by the shoulders, which
nature

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nature seems to have formed purposely for the plough. The unwieldy magnitude of his body, the slowness of his paces, the shortness of his legs, every thing, even his quietness and patience in toil, evidently concur to fit him for tillage, and enable him, beyond any other animal, to surmount the constant resistance of the earth against his efforts. The horse, though perhaps equally strong, is less proper for this use; his legs are too long, his paces too quick and impetuous, and he soon frets and tires. Besides, by putting him to the plough, we deprive him of all the agility and suppleness of his motions; of all the beauty of his attitude and carriage: for this heavy work requires rather perseverance than hard labour; rather strength than swiftness, and weight rather than elasticity: and accordingly, wherever the comparison had been made with any degree of accuracy between horses and oxen for the labours of the field, and especially for ploughing, the difference has been found to be considerably in favour of the latter, in every respect but that of speed; and even in this article their inferiority amounts to nothing more than being two hours in a day longer at work than horses: for they perform the same quantity of work every day, and that too in a better manner. It is universally allowed that they are cheaper in every sense; for they cost less when bought, are less expensive in their food, their harness, and their shoeing, are subject to much fewer disorders, require far less attendance, and at last remain fit for fattening when their labours are over, as was before observed. Yet, strange fatuity! notwithstanding all these advantages, they are so little used at present for the works of husbandry in this kingdom, that, if we may trust to the report of the author of the *Six Months*

Tour

Tour through the North of Edgland (a), and surely we may confide in what that gentleman says from his own personal inquiries and observations on the spot, whole counties in England, which, not many years ago, scarcely possessed a plough-horse, now have not a single ploughing-ox.

To account for this very extraordinary and every way highly detrimental change, and at the same time to refute the groundless opinion of those who look upon it as a kind of proof that horses are really preferable, the author here referred to, Arthur Young, Esq; F. R. S. very judiciously attributes it to the great price which live cattle have yielded of late years. "It is well known," says he, "that the regular course of business in the ox-counties used to be, to keep three sets of beasts; one of young cattle that were coming into work; the teams; and fattening cattle, that had been worked three years. But when cattle came to be so very dear, as to cost when lean near as much as they sold for when fat, the ox-farmers were tempted to sell their young stock before they ploughed them; or at least to throw them directly to fattening, that their high value might come in the sooner. And as horses, once bought, required no annual addition, they by degrees increased with all poor farmers, to enable them to sell their oxen at high prices. The great decrease of the use of oxen during the period of live cattle selling so very high, gives some reason to suppose this the cause of it. I need not, surely, add, that this, or indeed any other reason that can be offered, is and must be false and incomplete; and that the use of them in tillage is much superior to that

(a) *Vol. IV. Letter xxxii.*

“ of horses. The avarice of the farmers has
 “ alone driven them out of use, not for the sake
 “ of profit, but for raising money at a future
 “ expence. The great farmers in Northumber-
 “ land, who, we are certain, are not *poor*, still
 “ continue to make much use of oxen, *viz.*
 “ half and half.”

If the above arguments are not sufficient, the following indisputable fact, attested by the same observant writer, who relates what he himself saw, must surely silence for ever the most prejudiced advocates for ploughing with horses. (*b*)

Wenman Cooke, Esq; of Longford in Derbyshire, executes all his ploughing and home-carting, which are very considerable, with oxen harnessed in nearly the same manner as is practised for horses, excepting that the collars open to be buckled on, and are worn with the narrow end, which is the part that opens, downward. The chains are fastened to them in the same direction as in a horse-harness, but much above the chest, and in a line almost even with their backs. The beasts of course draw thus much higher than horses. He likewise finds, that they draw with much greater power in this manner than in yokes, that they move much faster, are more handy and convenient, and that they perform their work at much less expence than could be done by horses, as well as even more expeditiously, as appears from Mr. Cooke's ploughing as much land in a day with three oxen, as the farmers do with four or five horses. A disproportion so amazingly great, that, as Mr. Young very properly remarks, it decides at once, and in the clearest manner, the long-contested point, whether horses or oxen are fittest for the plough. Mr. Cooke

(*b*) In the *Farmer's Tour through the East of England*, vol. I. letter iv.

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feeds them in summer on grafs alone, and in winter on ftrow; on which laft, indeed, he works them only moderately; but if hard, they then have hay, or fome turneps. Mr. Young declares that he faw a team of oxen thus harnessed drawing a heavy load of bricks, and obferved that not one horfe-team in ten could have out-walked them. The drivers affured him, that they worked much better thus than when yoaked, that they were able to draw a greater weight, and were far more eafily managed. When oxen are yoaked, they move aukwardly, and often with fuch inequality between the couples, that, as is well known to all ox-drivers, it is common for one beaft to make it's companion bear the whole ftrefs of the draught. This inconvenience, as well as the objection that oxen trample the land too much when they are yoaked together in ploughing, is totally removed in Mr. Cooke's method, which feems in fact to be an improvement of M. de Chateauvieux's, mentioned in the fecond volume of my *System of Husbandry* (c). The making of the oxen go in a fingle line inftead of a double one, is alfo extremely ufeful in fome forts of ploughing; and it has been proved by repeated experience, that they may eafily be rendered fo tractable as to be guided by a line like horfes.

The Cow may alfo be rendered fit for the labours of the field, and, though not fo ftrong as the ox, be made to fupply his place: but when ſhe is employed in this ſervice, care ſhould be taken to match her as nearly as poſſible with an ox of equal ſtrength and ſize, in order to preſerve an equality of draught between them; for the

(c) *Page 92—94*: where is alfo a drawing of the ox-harnels invented by that illuſtrious cultivator.

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less unequal they are, the more easily and regularly the tillage is performed. Stiff lands, especially such as turn up in large long clods, often require six or eight oxen to plough them; whereas a sandy and loose soil may be tilled with only two cows: and besides, in this last, the furrows may be continued to a greater length than in the former. Among the antients, an hundred and twenty paces was the greatest length of a furrow which the ox was to make by one continued effort; after which, say they, he is not to be goaded farther, but allowed to breathe awhile, before the same furrow is continued, or another begun.—But, among the antients, agriculture was a favourite study: They did not disdain to put their own hands to the plough; at least, they countenanced the husbandman, and consulted both his ease and that of the ox: whereas amongst us, they who enjoy the most of the products of the earth are, in general, the last to esteem, encourage, and support the art of cultivation. There are few STUART MACKENZIES, sensible, like the immortal SULLY, that tillage and pastures are the only real foundation of the lasting prosperity of states.

The barren cow, which the country people call a *free martin*, has almost as much strength, and is nearly as fit for the works of husbandry as the ox. Its flesh too is said to be very nearly as good to eat *.

* We are told, but may perhaps desire leave to doubt it, that when a cow brings a bull and a cow-calf together, the latter is always a *free martin*, and never bears. The Romans were not unacquainted with the sterile cow, and called her *taura*. According to Mr. Lisle's information, the head of the free martin is coarser made than that of a heifer, her horns are wider spread, and her udder is smaller. He adds, that the flesh of a fatted free martin will fetch a halfpenny a pound more than any cow-beef.

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The principal use of the bull is to propagate the species; and though he also may be subjected to the yoke, yet one cannot be sure that he will work quietly, and the use which he may make of his prodigious strength is constantly to be guarded against. He is naturally untractable, stubborn and fierce, and, in the bulling season, absolutely uncontrollable, and often furious: but castration destroys the source of these violent impulses, without diminishing his strength. He also grows larger, heavier, and more unwieldy when castrated, and thereby becomes the better adapted to the labour for which he is intended. This operation likewise renders him more tractable, patient, docile, and less troublesome to others. A herd of bulls could not be either tamed or managed by all the skill and power of man.

Most country people know how to perform this operation: but the different effects which will result from the various times of performing it have not perhaps yet been sufficiently attended to. In general, the most proper age for castration is that immediately preceding puberty, which, in horned cattle, is eighteen months or two years; few of those that undergo the operation sooner long surviving it. It is true, indeed, that calves, whose testicles have been taken out soon after their birth, become, if they survive the operation, which is very dangerous at that early age, larger, fleshier, and fatter, than those which are not castrated till their second, third, or fourth year: but in return, these last seem to retain more spirit and activity; and those which are not castrated till their sixth, seventh, or eighth year, lose little or nothing of their other masculine qualities, being more impetuous and difficult to manage than other oxen; nay, in their

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bulling season, they endeavour to get at the cows, which must be carefully guarded against, because the copulation, or even the bare touch of such an ox, produces in the vulva of the cow a kind of carnosities or warts, which nothing but the actual cautery can destroy.

The horned cattle, of which we now speak, afford a proof that the heaviest and most sluggish animals are not always those which sleep the longest, nor the most soundly; for the sleep of these is short, and so unsound, that the least noise awakes them. They usually lie on the left side, and the kidney on that side is always larger, and has more fat about it, than that on the right side.

CHAP.

C H A P. II.

*Of the Choice of Cattle, and of fitting them
for Tillage.*

OXEN, like other domestic animals, are of various colours. The dun is the most common, and the redder it is, the more the creature is esteemed: the black are also valued; and bay oxen are said to be vigorous and long-lived; whereas the brown soon decay. The grey, the pied, and the white, are commonly deemed fit only for slaughter; it being the general opinion, which by the bye I doubt, that no pains can render them fit for labour. However, be that as it may, whatever is the colour of an ox's coat, it should be glossy, thick, and smooth to the touch; for if it be harsh, rough, or thin, there is room to suspect that the animal is out of order, or at least not of a strong constitution.

The age of the ox is known by his teeth and horns. The first fore-teeth, which he sheds at the end of ten months, are re-placed by others, larger, but not so white; at six months after this, the teeth, next to those in the middle, fall out, and are also replaced by others; and in three years all the incisory teeth are renewed. They are then even, long, and pretty white; but as the creature advances in years they wear, and become unequal and black. It is the same with the bull and the cow; so that, consequently, the growth and shedding of teeth are not affected by castration, nor by the difference of sexes. Neither is the shedding of their horns affected by either; for the ox, the bull, and the

cow, lose them alike at the end of three years, and they are alike re-placed by other horns, which, like the second teeth, remain; only the horns of the ox and cow are thicker and longer than those of the bull. The manner in which these second horns grow is not uniform, nor is their shooting equal. In the first year of their appearance, which is the fourth of the ox's age, two small pointed horns bud forth, neatly formed, smooth, and terminated by a kind of button towards the head of the animal. The next year this button moves from the head, being impelled by a corneous cylinder, which, also lengthening, is terminated by another button, and so on; for the horns continue to grow as long as the creature lives. These buttons become rings, or annular joints, which are easily distinguished in the horn, and by which the age of the animal may at once be known; reckoning three years for the point of the horn down to the first joint, and one year for each of the other intervals.

A good ox for the plough must be neither too fat nor too lean; his head should be short and thick; his ears large and shaggy; his horns strong, glossy, and of a middling size; his forehead broad; his eyes full and black; his muzzle thick, short, and flat; his nostrils wide and open; his teeth white and even; his lips black; his neck fleshy; his shoulders large and heavy; his breast broad; his dew-lap hanging down to his knees; his reins very broad; his ribs broad, and not close; his belly spacious and sloping downward; his flanks firm; his haunches large; his rump thick and very round; his thighs and legs large, fleshy, and nervous; his back strait and full; his tail reaching to the ground, and well covered with thick and fine hair; his feet firm; his hide thick and pliable; his muscles

raised; and his hoof short and broad: he must also answer to the goad; be obedient to the voice of his driver, and easy to govern: but it is only gradually, and by beginning early, that he is brought willing to bear the yoke, and be easily managed.

At the age of two years and a half, or at farthest three, it is time to begin to tame him, and bring him under subjection; for if this is delayed longer, he becomes headstrong, and often ungovernable. The only method of succeeding herein is, by patience, mildness, and even caresses; for violence and rough usage will only disgust him beyond the power of recovery: stroaking him gently along the back, clapping him with the hand, giving him occasionally boiled barley, ground beans, and such other aliments as please him most, all of them mixed with salt, of which he is very fond, will prove of the greatest use. At the same time a rope should be frequently tied about his horns, and some time after the yoke should be put about his neck, and fastened, first to a pair of wheels only, and then to a plough, with another ox of the same size ready trained: after this, they should be tied together at the same manger, and be led together to pasture, that they may become acquainted, and accustomed to step alike. The goad should never be made use of at first, because it then would only render him more untractable: he must also be indulged, and labour only at short intervals; for till he has been thoroughly trained, he tires himself very much; for which reason also he should then be fed more plentifully than at other times. Also, when he is to work, especially if it be in stiff or stony ground, and likewise when he is to go upon the road, he should be shod, or, as the country peo-

ple and farriers term it, cued. He should draw the plough only from his third to his tenth year; for after this it will be adviseable to fatten and sell him, his flesh being then better than if he was kept longer.

It is said, that oxen which feed slowly bear labour better than those which eat faster; that such as have been bred in dry and high countries are handsomer, more vigorous, and more sprightly than those of low and moist countries; that dry hay strengthens them more than soft grass; that they cannot bear a change of climate so well as horses; and that, for this reason, oxen for labour should always be purchased in the neighbourhood of the place where they are to work.

In general, countries somewhat colder than our own seem to agree better with black cattle than those which are hotter; and they are larger and more fleshy, in proportion as the climate is moister, and abounds in pasture.

The largest black cattle that we know of are those of Denmark, Podolia, the Ukraine, and Calmuck Tartary. The English, Irish, Dutch, and Hungarian cattle are also larger than those of Persia, Turkey, Greece, Italy, France, and Spain; and the smallest we know of are those of Barbary, and our own islands of Alderney and Man. The Dutch import yearly from Denmark numbers of large lean cows, which, when improved by living in the rich pastures of Holland, yield a great deal more milk and butter than our common breed of cows: their calves are also much larger and stronger; and except four or five days before their calving, they may be milked during the whole year. These cows, commonly called Flanders cows, require excellent pastures, though they eat little more than
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the common sort; but as they are always lean, the superabundance of their food turns wholly to milk; whereas our common cows, after living some time in luxuriant pastures, become fat, and yield little or no milk. From a bull of this kind and a common cow, is produced another breed, called *bastard*, which is both more prolific, and abounds more in milk than the common breed. These *bastard* cows often bring two calves at once, and also yield milk all the year round. They constitute a large part of the wealth of Holland, which exports every year butter and cheese to a very considerable amount. These cows give much more milk than our common ones, as was before said, twice as much as those of France, and six times as much as those of Barbary.

The best English oxen and cows, for largeness and neatness of shape, are bred in the counties of York, Derby, Lancaster, Stafford, Lincoln, Gloucester, and Somerset. Those bred in Yorkshire, Derbyshire, Lancashire, and Staffordshire, are generally black, with large well-spread horns: those of Lincolnshire are, for the most part, pied, very tall and large, and fittest for labour: those bred in Somersetshire and Gloucestershire are generally red, and for shape much like those of Lincolnshire. Wiltshire breeds large cattle, but with ill-shaped heads and horns. Surry is famed for a breed of white cows, which are said to yield an uncommonly rich milk; and it is added, that their flesh takes salt more readily than that of any other breed. The black sort is commonly the smallest, but at the same time very strong, and consequently fit for labour. The cows of this colour seldom yield more than a gallon of milk at a meal, as it is called; but continue to bear being milked till

within a very few days of calving. The white and red sorts give, in general, near three times as much milk as the black, but grow dry much sooner; especially the white. The red kind is generally the largest of any sort we have in England, and is commonly thought to give more and richer milk than those of other colours: some likewise say that they bring better calves, and therefore advise keeping this breed free from mixture with any other. — It may certainly be looked upon as a general rule, that the cow which gives milk longest is best both for the dairy and for breeding; and that the younger the cow is, the better will be the breed, provided she be past her second year.

A gentleman will choose the cow that gives the best milk, in preference to one which yields a larger quantity of less good; whereas the latter will answer best to the farmer, for fattening calves, lambs, and his whole breed of swine. The bullock of a moderate size will also be preferred by the gentleman, for beef for his table, because it's flesh is better relished, and finer grained; and the larger size may be more prized by the farmer, because they fetch more money at market, their flesh being most esteemed for salting, especially for naval use; for it is found to shrink less, and to be less preyed on by the salt, than the beef of smaller cattle.

C H A P. III.

Of Feeding, Fattening and Tending of Cattle.

THE ox eats fast, and takes in a short time all the nourishment he wants, after which he ceases to eat, and lies down to chew the cud; whereas the horse feeds both day and night, slowly, but almost incessantly. This difference in their manner of feeding proceeds from the different make of their stomachs: for the ox, whose two first stomachs form but one very capacious bag, can easily swallow so large a quantity of herbage as soon to fill his maw, and that done, he chews the cud afterwards, and digests it at leisure; whilst the horse, having but a small stomach, can put into it only a small quantity of grass, and continue to replenish it as the food sinks and passes into the intestines, where the decomposition of the aliments is chiefly performed: and accordingly, upon inspection of these parts both in the ox and the horse, and the successive effect of digestion, particularly the decomposition of hay, M. de Buffon saw, (a) that, in the ox, on it's leaving that part of the maw which forms the second stomach, it is reduced to a kind of green paste, like spinach minced and boiled; that it retains this appearance in the folds of the third stomach; that the decomposition is completed in the fourth sto-

(a) *Histoire Naturelle du Boeuf.*

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mach; and that what passes into the intestines is only the husks and recrements: whereas in the horse, he observed, that this decomposition is hardly visible, either in the stomach or first intestines, where it becomes only more supple and flexible, having been macerated and penetrated by the active liquor with which it is surrounded; and that it reaches the cœcum and colon without any great alteration; that it is in these two intestines, whose enormous capacity answers to the maw in ruminating animals, that the decomposition of a horse's aliment is chiefly performed; and that this decomposition is never so perfect as that in the fourth stomach of the ox.

From these observations, and the bare inspection of the parts, it is easy to conceive, how rumination is performed, and why the horse neither ruminates nor vomits; whereas the ox, and all horned cattle, with other animals which have several stomachs, seem to digest the grass only by rumination, which is nothing more than vomiting without effort, occasioned by the re-action of the first stomach on the aliments it contains. The ox fills his two first stomachs (the second being only a part of the first), and the membrane thus extended re-acts on the grass within it, which has been but very little chewed, and it's bulk increased by fermentation. Were the aliment liquid, this contracted force would make it pass into the third stomach, which communicates with the other only by a narrow duct, the orifice of which is situated at the upper part of the first, and but little below the œsophagus; so that no dry aliment can pass through this duct, or at least none but the more fluid part of it. Thus the drier parts necessarily ascend through the œsophagus, whose orifice is larger than that of the duct into the mouth. Here the animal chews them again, macerates, and once more impregnates them with

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it's saliva; and thus by degrees renders the aliment more fluid, till it is reduced to a paste of a proper liquidity to pass through the duct which communicates with the third stomach: and here again it undergoes another maceration, before it passes into the fourth stomach, where the decomposition of the food is completed, by being reduced to a perfect mucilage.

What confirms the truth of this explanation is, that while these animals suck, or are fed with milk and other fluid aliments, they do not chew the cud; and that they chew the cud much more in winter, and when fed with dry food, than in summer, when the grass is succulent and tender. In the horse, on the contrary, the stomach is very small, the orifice of the œsophagus very narrow, and the passage from the stomach to the intestines, or pylorus, very wide, which alone would render rumination impracticable; for the food contained in this small stomach, though perhaps more strongly compressed than in the large stomach of the ox, cannot re-ascend, because it may so easily descend through the capacious orifice of the pylorus. It is therefore owing to this general difference in the conformation of the parts, that the ox ruminates and the horse cannot: but there is another particular formation in the horse, which renders him not only unable to ruminate, that is, to vomit without effort, but even hinders him from vomiting at all, though he should make the strongest efforts so to do; and this is, that the duct of the œsophagus enters so obliquely into the horse's stomach, that instead of opening by the convulsive motions of the stomach, it becomes contracted. Though this difference, like all the other differences of conformation observable in the bodies of animals, depends on nature when constant and unvaried; yet, in the growth, and especially in the soft parts,

parts, there are differences apparently constant, which however may, and actually do, vary by circumstances: for instance, the capacity of the ox's maw is not wholly derived from nature; it is not such by it's primitive conformation, but is gradually rendered so by the large bulk of the aliments put into it; for in a young calf, or even in one that is older, if the animal has fed only on milk, and never on herbage, the maw is much smaller in proportion than in the ox. The very great capacity of the maw therefore proceeds from the extension occasioned by the large bulk of aliments put into it at one time; as M. de Buffon has clearly proved by the following experiment (*b*). He caused two calves of the same age, and weaned at the same time, to be fed, one with bread, and the other with grass; and at the expiration of a year, on opening them, the maw of the calf which had lived on grass and herbage was become much larger than the maw of that which had been fed with bread.—I have been the more particular in the above account of the manner in which ruminating animals are nourished, and of the causes why the horse can neither ruminate nor vomit, because it may afford some satisfaction to those who might not, perhaps, otherwise be able readily to assign a reason for their different ways of feeding.

A general caution proper to be attended to on this occasion, is, that great care should be taken not to over-stock a pasture with cattle; because the greatest profit really arises from their being constantly kept in good condition; especially those that give milk, and those that are big with young. The stunted breed of cattle which we often meet with, and usually impute to the poorness of the pasture, badness of the climate, &c. is in fact generally owing to the mismanagement

(*b*) See *ibid*.

of

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of their owners, who, through a very ill-judged greediness, over-stock their pastures, and thereby disable the mothers from giving sufficient nourishment to their young, either before or after they are born: and this original stinting sticks by them through life, unless they chance to get very early into a rich pasture; for then, indeed, they sometimes soon outstrip their original breed; a circumstance which proves, that if they were at all times equally well kept, the breed would be much mended.

As oxen are not worked much in the winter, good straw, and a little hay will then nourish them sufficiently: but during the time that they do labour, they should have a great deal more hay than straw, and even a little bran or oats before they go to work. In summer, if hay be scarce, they may have grass fresh cut from the field, or the young succulent boughs and shoots of ash, elm, oak, and other trees; but these last should be given sparingly, because an excess of this aliment, of which they are very fond, sometimes causes them to make bloody urine. Clover, lucerne, sainfoin, burnet, when these can be had, vetches, boiled barley, turnips, carrots, parsnips, cabbages, &c. are also excellent food for these animals. There is no need to measure out the quantity of their food, because they never eat more than they want; and it is therefore proper always to give them more than they do eat*. They should never be turned into the pastures till about the middle of May; because the first growth of the grass and other herbs is

* Cattle, and all other animals which chew the cud, have the singular advantage that they never eat more at once than is sufficient for them; for they then lie down and chew the cud: whereas horses, and many other animals, continue to eat as long as they are able to swallow.

too crude; and though they eat them greedily, they disagree with them. After they have spent the summer in the pastures, they should be housed about the middle of October; taking care that these transitions from green food to dry, and from dry to green, be not done at once, but by degrees.

The custom of giving salt among the fodder is of an old date, for Columella mentions it (c) as the practice of his time, and very properly recommends it much, as well calculated to promote their appetite, and consequently to assist their fattening.—I have heard it observed by a gentleman from America, that the desire for salt is much greater in cattle and horses at a distance from the sea, than in the countries near it; owing perhaps to a greater freshness of the water. It has been remarked particularly in the horses bred near the sea in New England, which at home do not shew any extraordinary desire for salt; but when sold into inland parts, they become as fond of salt as the creatures reared there. Even in Switzerland, the native horses of that country are very fond of salt, and it is a constant custom to give it them. There are in several parts of America, distant from the sea, spots discovered by the wild beasts, such as deer and buffaloes, where the earth is of a saline nature, to which these creatures resort regularly, and lick the earth with their tongues. They are called *salt-licks*, and are sometimes an hundred or an hundred and fifty feet wide.

Salt mixed with hay which has not been well got in, seems to act as an enemy to that fermentation in the juices which raises the heat in the hay: for where it is mixed with paste or other soft substances, it prevents putrefaction; probably

(c) *Lib. VI, c. iv.*

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by hindering the necessary preceding ferment.— Thus it becomes useful in hay on a double account.

Though violent cold is very hurtful to these creatures, great heat is perhaps still more so. For this reason, in the summer-time they should be led to their work by break of day, and when it grows very hot, be either sent home, or left to feed under the shade of trees, and not returned to work again till three or four o'clock in the afternoon. In autumn, winter, and spring, they may be at plough from eight or nine in the morning till five or six in the evening without intermission. But I cannot, by any means, approve of keeping them continually out of doors; especially for cows that give milk, or are with calf. It is surely inhuman to expose a creature to a degree of cold which it is not naturally fenced against.

Though oxen do not require so much attendance as horses, yet to keep them brisk and healthy, it will be proper, especially when they work, to curry them every day, to rub them down, wash them, clear their feet of gravel and dirt, grease their hoofs, &c. They must also have drink twice a day, morning and evening. The horse likes a thick and warmish water; but for the ox it must be clear and cool. The pavement of their stables should be a little inclined, that wet may not rest on it, and they should also have dry litter laid under them.

The age at which oxen are generally fattened is their tenth year, because there is no certainty of succeeding therein afterwards, nor is their flesh so good when they are older. They may be fattened in any season of the year; but summer is commonly chosen, because it is done then at least expence. If it is begun in May or June,
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they are generally compleatly fattened before the end of October. From the very beginning to fatten them, they must be taken from all work, drink often, and have plenty of succulent food, sometimes mingled with a little salt as before said; or, when a beast falls off his stomach, grasse dipped in vinegar will also restore his appetite, and consequently help to make him fatten the sooner. They must not be disturbed while they are chewing the cud; and during the great heats, they should sleep in a cow-house, or some other shady place. By this means they will become so fat in four or five months, as to be scarce able to walk; so that if they are to be sent to any distant place, it must be by very slow journies that they are removed. Cows, and even bulls whose testicles have been knit, may also be fattened: but the flesh of cows is drier, and that of the knit-bull redder and tougher, than the flesh of oxen; and that of the bull has always a strong disagreeable taste.

Turnips are made to yield a great profit in feeding and fattening of cattle, particularly in Norfolk, and, of late years, in several other counties in England. When large, they should be sliced, as well to enable the beasts to eat the quicker, as to prevent their choaking themselves, which they would otherwise be apt to do. Carrots are a yet wholesomer, much more substantial, and consequently more profitable food: besides which, they render the flesh of the cattle that are fed with them firmer and better tasted, as the Flemings have long experienced: but a yet more nourishing food is parsnips, especially for milch-cows, which, when fed with them, give more milk than with any other winter-fodder, and that milk yields better butter than the milk of cows nourished with any other substance.

Cattle

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Cattle eat these roots raw at first, sliced lengthwise; and when they begin not to relish them, they are cut in pieces, put into a large copper, pressed down there, and boiled with only so much water as fills up the chasms between them. Our neighbours in Britany reckon one crop of parsnips, used for feeding cattle, equal in value to more than three crops of wheat (*b*). Potatoes are another good and very heartening food, and may, as was before said of parsnips, be par-boiled when cattle like them best that way.—Buck-wheat makes very good fodder for cattle; and so does, in particular, the yellow-flowered vetch. In Germany and Flanders, spurrey is preferred before any other fodder, not excepting even corn, and is found to produce the richest milk and best butter. Cabbages, especially the Scotch kale and the great American cabbage, are reckoned preferable to turnips, in point of health as well as speed in fattening, and it is said, that one acre of them will go as far as three of turnips: but it is to be observed, that in using them, especially for milch-cows, the withered or decayed leaves should be thrown away, because they are thought to give a bad taste to the milk.

Clover is undoubtedly an excellent food for cattle, and we are told that one acre of it will feed as many of them as four or five acres of common grass: but they should never be turned into it in wet weather, nor whilst the dew is yet upon the plant, lest it should burst them. It should be given them sparingly at first, till it purges them: for when it has produced this effect, the danger is generally over. But of all

(*b*) *Observations de la Société d'Agriculture, de Commerce, et des Arts, établie par les Etats de Bretagne. Années 1757, et 1758, p. 88.*

the plants that are given to cattle for their food, none is equal to lucerne, either for early, speedy, or good fattening; for with this the grazier may begin fattening towards the end of April, and finish about the middle of harvest, when meat generally bears an high price. A large fattening ox may be allowed forty pounds, or perhaps more, of green lucerne each day *. All cattle are remarkably fond of lucerne, and always prefer that which has been cut a day or two, and stood twenty-four or forty-eight hours in a dry shady place. By this precaution too all danger of it's swelling them, which it might otherwise be apt to do, like clover and trefoil, is removed: only it is to be observed, that more caution should be used in giving it to cows, than to bullocks. When oxen or heifers are fed for the butcher with lucerne, the fat will spread itself through the lean, like veins in marble; and the flesh will be remarkably well-flavoured.

Oil-cakes, meaning the residue of the seeds of lin, rape, or coleseed, after their oil has been expressed from them, are well known to be great fatteners of cattle, especially if these drink plentifully with them: but they are apt to render the fat yellow and rank. To remedy this, the cattle should be fed with dry fodder, for a fortnight or three weeks before they are killed.

A beast is well-fed outwardly, that is to say, well covered with flesh, when his huckle-bones appear round and plump, his ribs smooth, his flanks full, his neck thick, his cod round, and, on feeling him upon the nethermost ribs, the skin feels soft and loose; and if, besides the above

* The antient Romans allowed twenty pounds of lucerne-hay at night to a large labouring ox, that was not fattening.

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marks, the setting on of the tail feels thick, full and soft, and the navel round, soft, large and plump, it is a sure sign that he is also well tallowed, that is, well fattened inwardly.

All these creatures are very apt to lick themselves, when at rest, and this is thought to be an impediment to their fattening. To prevent it, all the parts of their bodies within their reach are rubbed over with their dung; without this precaution, their tongues, which are very rough, abrade, or take off their hair, which they swallow; and as this cannot be digested, it remains in the stomach, gathers together there, and forms by degrees round balls, called *agagropiles*, which always hinder digestion, and sometimes grow so large as to be very troublesome, and even to endanger the life of the animal. They are, in time, covered with a brown crust proceeding from an inspissated mucilage, which, by continual friction and coction in the stomach, becomes hard and glossy. These balls are found only in the maw; for if any hair gets into the other stomachs, it does not remain either there or in the intestines, but probably goes off with the excrements. However, this subject, and the disorders occasioned by these balls will be treated of more fully in the fifth chapter of this book, where I shall speak of the distempers to which these animals are subject.

I cannot conclude this subject of the feeding of oxen, without adding M. de Buffon's just remark, that animals which have incisory teeth in both jaws, such as the horse and the ass, nip short herbage more easily than those whose upper jaw is without incisories; and if sheep and goats cut the grass very close, it is owing to the smallness and thinness of their lips; but the thick-lipped ox can only crop the long herbage; and this is

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the true reason why he never injures the pastures in which he lives. As he crops only the extremity of the long herbage, he does not affect the root, and retards it's growth but very little; whereas the sheep and the goat, by biting the herbage very close, both destroy the stem, and injure the crown of the root. The horse chooses the most slender herbage, and leaves the larger, whose stems are hard, to feed and multiply; whereas the ox crops those thick stems, and thereby destroys by degrees the coarser herbage. Hence it is, that, after some years, the herbage where a horse has lived becomes coarse; whereas that where the ox has fed becomes a fine pasture.

C H A P. IV.

Of the Propagation of Cattle; Care of the Cow whilst pregnant, and Management of the Calf till fit for Slaughter, or for Work.

SPRING is the usual season for cows to be in heat. In this country, most of them admit the bull, and become pregnant, between the middle of April and the middle of July. Some indeed are more forward, and other more backward in their heat. They go nine months, and calve at the beginning of the tenth; consequently the regular season for calves is from the middle of January to the middle of April: but there is no scarcity of them during the whole summer, autumn being the time when then they are least abundant. The tokens of the cow's heat are not at all equivocal: it is known by her frequent lowings, which are also more violent than at other times: she leaps on cows, oxen, and even bulls; and the vulva is inflated so as to project outward. The time of this strong heat should be particularly noticed, and the bull should be brought to her then; for if she be suffered to cool, she will not so certainly retain afterwards.

The bull, like the stallion among horses, should be chosen from among the most beautiful of the species, and between the age of three years and ten, as before observed; but the nearer he is to three, the greater will be his vigour. He should be large, well-made, and in good plight;

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his eyes should be black, his look proud, his forehead broad and curled, his head short, his horns thick, short, and black, his ears long and shaggy, his muzzle large, his nose short and strait, his neck thick and fleshy, his shoulders and breast broad, his reins firm, his back strait, his buttocks square, his tail high-placed, long, and full of hair, his thighs round and well trussed, his legs thick, short-jointed, and full of sinews, his knees round, big, and strait, his feet far asunder, not broad, nor turning in, but spreading easily, his hoofs long and hollow, his hide pliable, the hair of all his body thick, short, and soft as velvet, and his walk firm and steady.

The cow should be high of stature, her horns well spread, fair and smooth, her forehead broad and smooth, her body long, her belly round and large, and her udder white, not fleshy, but large and lank, with only four teats; these having been experienced to yield the most milk. She should also be young; and some hold it to be most adviseable for her to be of the same country as the bull, and as near as can be of the same colour.

The cow reaches the age of puberty at eighteen months, and the bull at two years; but though they are at that age capable of generating, it is adviseable not to suffer them to copulate under three years. The time of their greatest strength is from three to nine years, after which the best way of disposing of them is by fattening them for slaughter. As they acquire the greatest part of their growth in two years, the duration of life with them, as with most other species of animals, is nearly seven times two years; and accordingly we seldom find them live above fourteen or fifteen.

Cows often retain at the first, second, or third time of covering; and when they are pregnant, the

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the bull refuses to cover them again, whatever appearance of heat there may be in them. Indeed, their heat generally ceases almost immediately after they have conceived, and they themselves will not then suffer the bull to approach them.

Cows require greater care when pregnant than at other times; particularly, they should not then be suffered to leap over hedges, ditches, &c. or to do any other thing by which they may strain themselves; for they are subject to abortion: consequently they must not by any means be used for draught whilst in that condition; but they should then be put into the richest pastures, provided they be not too moist or fenny; and for six weeks or two months before they calve, they should be fed more plentifully than usual; giving them in the summer-time grass in the cow-house, and in the winter bran, lucerne, sainfoin, burnet, &c. During this time they must not be milked, that fluid being then absolutely necessary to the nourishment of the foetus. Some cows, indeed, do not yield any milk for a month or six weeks before they calve; but those which have milk to the time of calving are both the best mothers and the best nurses; though it is generally bad and in small quantity. The same care and cautions must be observed at the delivery of the cow, as at that of the mare; or rather more, the former seeming to be on this occasion more spent and weakened than the latter. One indispensable point is, to put her in a separate stall, where she must be kept warm, at her ease, and on good litter. She must be well fed for ten or twelve days after she has brought forth, with ground beans, corn, or oatmeal, diluted with water in which salt has been dissolved, and with lucerne, burnet, sainfoin, or good grass,

thoroughly ripe. By this time she is usually recovered, and may therefore by degrees be put to her common way of living, and turned into the pasture; observing not to take any milk from her during the two first months, that the calf may thrive the better; and besides, the milk is not then of a good quality *.

As soon as the young calf is born, whilst the mother licks it, or to excite her so to do, it is right to shrew over it a couple of handfuls of salt and crumbs of bread mixed together. This licking strengthens the calf, or at least clears it of all filth, which could not be removed by any other means, because the young creature is then too tender to be handled without danger; and at the same time it should be made to swallow the yolk of a raw egg, likewise to give it strength.

The young calf should be left with it's dam during the first five or six days, especially if it be in winter, in order that it may be kept constantly warm, and suck whenever it pleases; and at the end of this time, by which it will have gathered strength and have grown visibly, it must be tied

* Good milk is neither too thick nor too thin; it's proper consistence is, when a small drop preserves it's spherical form without spreading: it must also be of a delicate white; that with a yellow or blue cast being of little value. The taste of it must be soft, without any bitterness or acidity; it must have a good smell, or none at all. It is better in the month of May, and in summer, than in winter; and for it to be perfectly good, the cow must be of a proper age, and in good health. The milk of heifers is too thin; and that of old cows too oily, and in winter-time too thick. These different qualities of milk have relation to the butyrous, caseous, and serous parts of which it consists. Milk too thin abounds too much with serous particles; that which is too thick has few or none of these particles; and the too oily has not a proper portion of butyrous and serous particles. The milk of a cow when bulling is not good; nor that when the creature is near, or just past, the time of her calving. *Buffon, Hist. Nat. du Bœuf.*

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up in a separate pen at a little distance from her, that it may suck only when the keeper thinks proper; for it would exhaust the cow if left continually with her. Two or three times a day will now be often enough for it to suck; and when it has done sucking, it must be led back to its pen and tied up as before. After the mother is returned to pasture with the other cows, the calf should still be kept in the cow-house, and there made to suck twice a day before its dam goes out.

If it be intended to fatten the calf speedily, and at the same time render his flesh fine and delicate, he should have every day about half a dozen raw eggs, and crumb of bread boiled in milk. This, in four or five weeks time, will render his flesh excellent. Calves intended for the butcher should therefore not suck above thirty or forty days; but those designed for keeping should be left with the dam two months at least, because, the more they suck, the stronger and larger they will be. The best for bringing up are those that have been calved in the months of April, May, and June; for those which come later seldom acquire vigour enough to enable them to bear the inclemencies of the ensuing winter; cold making them droop, and often killing them. Thus, calves designed for keeping should be weaned at two, three, or four months: but before they are taken wholly from sucking, a little fine grass, or chopt hay, should be given them from time to time, to accustom them to this new aliment; after being used to which, they must never be suffered to come near their dam; either in the stall or pasture. They themselves should be sent to pasture every day, and remain there from morning to evening during the summer: but when the cold of autumn begins

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to set in, they must not be let out till late in the morning, and should be brought back early in the evening; and during the winter, the cold of that season being extremely detrimental to them, they must be kept very warm in a close cow-house, be well supplied with water, have sainfoin, lucerne, burnet, &c. mixed with their common grass, given them in the cow-house, and be let out only when the weather is very fine. A great deal of care is necessary to bring them through the first winter, which is the most dangerous period of their lives: for if they survive this, the following summer will strengthen them so that they will have nothing to fear from the cold of a second winter.

It sometimes happens that a calf is troublesome to rear because it will not readily take the teat, but must have it held a considerable time in it's mouth before it will suck; and likewise some shew for a long while a reluctance to suck at all, which is a sign of their having pimples under the tongue; a disorder to which young calves are subject, and which is easily cured by cutting them off with a pair of scissars, and washing the wound with vinegar and salt: others rub them with hog's lard and salt pounded very fine.

In Spain, and some other countries, they place near a young calf in the cow-house one of those stones called *salegres*; which are found in the mines of rock-salt: by licking this salt-stone whilst it's dam is at the pasture, it becomes so hungry and thirsty, that when the cow returns, the calf eagerly seizes the teat and sucks his fill; and by this means he fattens and thrives much faster than those to which no salt is given.

The clods of curdled milk which are found in the third and fourth stomach of a sucking calf,

are,

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are, after being dried in the air, the rennet made use of for curdling milk. The longer it is kept the better it is; and a very little of it is sufficient to turn a large quantity of milk, as is well known to all who keep dairies.

As to the rest, the management of milk and dairies is a subject so generally and so well understood in this country, that it might be needless for me to enlarge upon it here, any farther, perhaps, than just to observe in general, that the dairy should be kept extremely clean and well aired, at a distance from all disagreeable smells of any kind whatever, and that it should be so situated as to be of as equal a temperature as possible during the whole year, and therefore open to the north in summer, and to the south in winter. The dairy-maids should not only be clean in their persons, but also such whose perspiration is not rank.—The vessels in which milk is now kept are generally lined with lead, because it is a substance that cleans easily: but great care should be taken that the milk do not remain in any leaden vessel till it contracts the least degree of acidity; for if it does, it soon dissolves part of the lead, a very little of which will be of extremely bad consequences to health, by occasioning the most dangerous disorders in the stomach and bowels, and often depriving people of the use of their limbs, as is daily seen in painters, and in those employed in making white-lead.

CHAPTER V.

Of the Diseases of Horned Cattle.

THE treatment before directed in the several diseases of horses is, in general, in similar cases, so applicable to the whole species of animals commonly distinguished by the appellation of Horned Cattle, that little remains to be added here, unless it perhaps be, to point out some few particulars more peculiarly relative to the management of these last. The Romans paid very great attention to them, as sharing with man the labours of the field; and as the climate of Italy is more kindly than that of England, surely whatever care was necessary there, cannot be less requisite here. The writers of that country may therefore properly become our guides again on this occasion.

Nature has cloathed with thick furs, or warm covering, such creatures as she intended to be exposed to the severity of the cold: but as cattle are not sheltered with such defence, I really think it cruel to expose them too much to the inclemencies of the winter, as many among us are apt to do*. Such was not the practice of the

* For, notwithstanding the very strong arguments used by M. de Buffon, in support of his opinion, that these creatures are original natives of these climates; such as, in particular, that they are not found beyond Armenia and Persia in Asia, and Egypt and Barbary in Africa, (for he looks upon the buffalo, the aurock, and the bisonet, as creatures of a different species); I cannot but incline here to think somewhat differently from that great man, and that principally for this obvious reason: Nature, as is evident throughout the whole creation, gives to every animal a covering suited to the climate she intends it for; and that of the ox is plainly calculated for a warm region. It therefore seems to me not improbable, that our black cattle came originally from some more southern part.

Romans,

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Romans, who very expressly enjoin, that the ox, in particular, be defended from the cold by a warm stable, and, if it can be done, that there be a fire in it, which both Vegetius and Columella (a) declare to be of great advantage to this animal, as he thereby breathes a dry air, which carries off not only the exhalations from his own body, but also other noxious vapours. According to them, the manger should be so contrived that their food be not lost among their feet; and their stalls should be placed on dry ground, with a gentle slope to carry off their urine, and kept constantly clean with dry litter, especially for the labouring ox. How different from these directions is the condition of too many of our farmers yards where the cattle often stand knee deep in dirt!

When the ox returns from labour, his neck should be washed, and rubbed for a long time; his whole body too should be freed from clay or dirt, especially his feet, which should be well washed.

In summer, it is proper that cattle should stand in cool shades during the heat of the day, and in the night in the open air; for they contract as many diseases by suffering too great heat, as by being exposed to too much cold.

It is of great benefit to them to give to each, about once a week, a raw egg, and some salt in a pint of wine or ale; and to this may likewise be added bruised garlic, vervain, and rue.

Cattle do not require the clearest water, nor are they very much hurt by it if it is dirty; nevertheless, it is the duty of the person who attends them, to see that they drink the best water, and such as is clean, and that they be well fed. There is no danger of their over-feeding themselves; for when nature is satisfied, they lie

(a) *Lib. III. c. i.*

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down and chew the cud. Labour breaks, heat vexes, and cold penetrates an animal that is empty and exhausted, sooner than one that has been well fed: and surely no man will grudge them a sufficient plentiful allowance of food, who considers how far the price of oxen which perish through want, exceeds the expence of that food.

If oxen are put upon running at their full speed, or if they are otherwise over-fatigued, at any time of the year, but especially in the summer, either they contract thereby a looseness, which proves pernicious to them, or slight fevers: for this animal, being naturally slow, and rather adapted to easy labour than to swift motion, is grievously hurt, if forced to go beyond his strength.

Neither swine nor hens should come near their cribs; for when an ox has swallowed hen's dung with his food, he is presently tormented with violent pains in his belly; and when he swells with it he dies. In case of his having swallowed any, the best way is to give him three ounces of parsley-seed, half a pound of cummin-seed, and two pounds of honey, mixed together, and poured warm down his throat, to force him to walk, and to rub him heartily till the draught moves his belly. The ashes of any wood well sifted, boiled in a sufficient quantity of oil to render them liquid, and then poured down the ox's throat, will also be of great benefit against the bad effects of this sort of dung.

But if an ox swallows hog's dung, or more especially the filth which a sick sow has vomited, he is presently seized with so contagious a disease, that it speedily affects a whole herd. When therefore there is the least suspicion of this distemper, the cattle must be removed and separated
to

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to pastures where none such have been fed, that so they may not hurt one another; for by feeding they infect the grass, and the water by drinking of it. An ox, though otherwise in perfect health, may perish by the smell and breath of the diseased blowing upon him. When this happens, the dead carcase must be carried to a distance, and buried deep, lest the sound be infected by it, and the negligence of the owner be imputed (as is usually done by fools, says Vegetius) to the divine displeasure. In the case here spoken of, he recommends half an ounce of squills sliced thin, infused in a pint of wine, with about two ounces of salt, to be given every morning to each creature thus infected.—But as infectious diseases will be the professed subject of the last part of this work, I shall not enlarge upon them here, any farther than just to mention the similitude which Mr. Osmer thinks there is between the distemper in horses before described, and that amongst oxen.

“ To the best of my observation,” says he,
 “ what is called the distemper amongst the
 “ horned cattle, is exactly correspondent to the
 “ distemper amongst the horses; the symptoms
 “ in each animal being similar in all respects.—
 “ The discharge from the nostrils, &c. of the
 “ cow in these fevers, about the nature of which,
 “ and of this distemper, there has been abundance of fine writing, is nothing else but an
 “ extravasation of the serous particles of the
 “ blood, the effect of inflammation; and therefore, in obedience to the attempts of nature,
 “ our business is to invent all the methods we
 “ can to carry off this extravasated serum; and
 “ the incisions, as before directed for the horse,
 “ made in the skin of the cow, will, as it does
 “ in horses with the same sort of fever, produce
 “ in

“ in twenty-four hours a nasty foetid purulent
 “ matter. By a number of these drains the
 “ parts will be unloaded, and the animal re-
 “ lieved, and they do in all inflammatory fevers
 “ amongst horses, and I dare say will too amongst
 “ the cows, answer nearly the same end and
 “ purpose as a critical abscess. But when no
 “ critical abscess happens, or no artificial drains
 “ are made use of, the natural ones not being
 “ sufficient to carry off the extravated serum,
 “ the viscera and more noble parts are, in time,
 “ affected, the blood and juices deviate by de-
 “ grees into a state of putrefaction and corrupti-
 “ on, and the animal dies a most wretched
 “ death.

“ If any man object and say, this distemper of
 “ the cows is infectious, and therefore it is of
 “ the putrid, and not of the inflammatory
 “ kind:—I answer, that it does not appear to
 “ be infectious, because some cows amongst a
 “ number of infected ones have escaped it. But
 “ allowing it to be of the putrid or pestilential
 “ kind, and to arise from air, infection, or both,
 “ these artificial drains made in the skin will be
 “ very proper, because they will answer in some
 “ measure the same end, as the bubo or critical
 “ imposthume befalling the human species in
 “ pestilential disorders, if they are properly ma-
 “ naged.—And here it may be observed, that
 “ when distempered cows have escaped death, it
 “ has been generally owing to some critical ab-
 “ scess; various instances of which I have seen.
 “ To these artificial drains should be added
 “ the use of cooling salts, and laxative glysters,
 “ if needful.

“ It is necessary ever to remember, that bleed-
 “ ing the horse or cow will be wrong, and must
 “ do harm, when a discharge from the nostrils,

“ &c.

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“ &c. is begun, because it is contrary to the
 “ effort of nature ; and so it is when there is any
 “ swelling that is tending to matter, which kinds
 “ of swellings can be distinguished by the skilful
 “ only.”

Indigestion is very hurtful to oxen, and is known by the following signs: frequently belching, loathing of their food, noise in their belly, heavy eyes: the creature neither chews his cud, nor licks himself as usual.—In this case, pour down his throat two gallons of water as warm as he can bear it, and soon after give him about thirty leaves of colewort boiled in water, and afterwards soaked in vinegar; and he must abstain from food for one day.

Neglected indigestion brings on colics: but these having already been fully treated of in the diseases of horses, I shall here mention *boving*, a disorder which is almost peculiar to the horned cattle.

This disorder proceeds from a too-sudden ferment in their green succulent food, whereby the elastic air let loose by the fermentation, but confined by the hard fæces which do not speedily enough give way to it, becomes highly acrid, like the gas arising from fermented liquors, which often proves mortal to those who breathe it. The method of cure should therefore be, clearing the great gut of hard excrement, injecting a stimulating glyster, and giving cooling things internally. This agrees with what M. Bourgelat proposes, when he says (*b*), “ Thus it is, for
 “ example, that with nitre given in half a glass
 “ of brandy, and often even with emollient
 “ glysters only, we have saved considerable
 “ numbers of oxen ready to expire in their
 “ pastures, after vain endeavours had been used
 “ to ease them, according to the common

(*b*) *Ecole vétérinaire ; Matière Médicale, p. 112.*

“ practice, by many incisions made in the skin,
 “ doubtless with an intention to disengage the
 “ cellular membrane from the air that, filled it,
 “ and of which carminatives would inevitably
 “ have increased the disorder, and hastened the
 “ death of the beast.”

Farmers are apt to fall into a great error when their cattle have got the better of this disorder; and that is, by letting them become costive again, and consequently liable to a return of the same danger when they next feed on succulent plants; whereas were they to continue to give them green food after a purging has been once brought on, no farther inconvenience could ensue. Immersing them in cold water when thus distended brings on an immediate purging, and thereby saves their lives.

The mouths and tongues of horned cattle are subject to the same sorts of swellings as those of horses, and alike productive of an inability to eat.

These should also be cut off with a knife or scissars, and then rubbed with salt and let heal. If they have no appetite to their food, and yet no signs of indisposition appear, it will be proper to rub their chops with salt and garlic beaten together, or with some other stimulating substance.

The cure of internal diseases in cattle is so nearly the same as for horses, and the doses of their medicines so much alike, that a repetition of them here seems needless. The causes of their lamenesses, and the methods of curing them, are also similar; and the feet of both require so nearly the same cutting and care of the hoof, that the least degree of intelligence will suffice to vary them properly.

The castration of calves is likewise performed in the same manner as that of horses.

B O O K V.

Of S H E E P.

C H A P. I.

Of the Qualities and different Kinds of Sheep.

"SHEEP have golden feet, and wherever they set them the earth becomes gold," say the Swedes, by way of expressing their high estimation of this animal. In effect, there is not any one domestic creature which yields greater profit to man than sheep do. Their flesh, their milk, their skin, their intestines, their dung, in short, every part of them, is necessary for some use or other, and turns to good account.

Though their flesh and milk furnish us with variety of excellent food, yet their wool is the chief object, especially to a commercial nation like this; for of it is formed in Britain the staple-commodity to which we owe the wealth and grandeur that render us the arbiters of power in Europe.

At the same time that this creature is the most useful, it is also, in itself, one of the most defenceless against enemies: Providence intending, as it would seem, that it should owe its very existence to our care, and be entitled to our protection, in return for the means of enjoyment and wealth which it affords us: for it not only wants protection but care also, more than any other domestic animal.—Sheep are of a very weakly constitution; much fatigue exhausts them; they can ill bear extremes of heat or cold; their diseases are many, and most of them contagious;

and their yeaning is attended with difficulty and danger.

They are said to be sensible to the charms of music, so as to feed more assiduously, to be in better health, and to fatten sooner by the sound of a pipe: but perhaps it may be more rightly thought, that music serves to amuse the shepherd's tedious hours, and even that the origin of that art was owing to this solitary life.

Sheep love their keepers and those who take care of them; they follow them, and obey their voice. It must however be observed, that if the shepherd has not a watchful eye over them, one or other of his sheep may easily stray from the rest of the flock, wander into places it is unacquainted with, and there fall down a precipice, or tumble into a hole or ditch, especially, if the creature has been frightened, which sheep very easily are; for when they have once lost their way, they run strait on, without stopping, and always directly against the wind, particularly if it blows hard, and they chance to be in an open place, a wide road, or on the borders of the sea. They are very fond of light, and never thrive well in dark places; and such is their fondness for society, that frequently a sheep left alone will pine away, become emaciated, and quite lose his strength.

The re-establishment of the best kinds of sheep in England, and greater care of their fleeces, are objects well deserving the attention of government: for, notwithstanding all our boasted improvements, it is certain that the quality of our wool in general has been on the decline for some time past*. These

(*) Mr. Lisle, whose judgment and veracity in matters of this kind stand unimpeached, tells us, in his *Observations on Husbandry*, article *Sheep*, that, even so late as his time, and he has not been dead many years, the clothiers complained that our Herefordshire wool, and particularly that of our great staple, was no longer so fine as formerly.

useful creatures, which were the chief wealth of former ages, become of still greater value as art and industry increase among us. One cannot, therefore, but be astonished at the indifference into which this nation has fallen with regard to her sheep, and especially too at a time when every other country is exerting it's utmost endeavours to improve it's breed, and the manner of managing it's flocks. At this very instant, we are strongly called upon to be particularly attentive to this great object, by the measures which the French are indefatigably pursuing to improve the breed of their sheep, by introducing those of every country where they excel.

We have no particular accounts of what our sheep were in antient times; though we may presume that our wool was always sought for by foreign manufacturers, because our History informs us, that the duty paid on the exportation of it was a considerable article of the royal revenue (+).

If we take a general view of the whole of England, we shall find, that the temperature of our climate, and the quality and almost perpetual verdure of our pastures, render it one of the best situated countries in the world for raising flocks of sheep. We are free from every discouraging circumstance with regard to them. We have no armies of insects or reptiles that are enemies to them; no wolves, nor any other animal whose nature is to prey upon them, if we except

(*) In former times, "the wealth of the nobility, gentry, and monasteries consisted chiefly in wool, which also then made the bulk of private property at home. It was at the same time the prime article in commerce. Aids to the crown was granted therein. It supplied the demands for the support of armies, the payment of subsidies, and all other expences incurred on the account of the public in foreign parts," says the learned Dr. Campbell, in *vol. II.* p. 152, of his excellent *Political Survey of Great Britain.*

foxes, of which again the numbers are scarcely more than suffice to give proper healthy exercise to men, who might otherwise indulge themselves in too much ease. Our frost and snow are generally of short continuance. Our extensive downs, our hills, the sides of our mountains, and even our steep rocks, abound in fine grass, which feeds a smaller breed of sheep; whilst our richer pastures of Lincolnshire and Ely maintain those of a larger size; and we are surrounded with a sea-coast, the air of which is thought to be peculiarly favourable to the health and thriving of sheep, as well as to the fineness of their wool.—The air of the sea is found to be so wholesome and favourable to sheep, that the husbandmen who live at a distance from that element find their advantage in recruiting their flocks with sheep from near the sea.

Columella (a) mentions the several kinds of sheep most in repute in his days, and gives an instance of the judgment of his uncle, M. Columella, an excellent husbandman, in mending the breed of his own sheep, by coupling with them rams brought from Africa: and indeed it is highly probable, that the excellence of the Spanish wool, now so justly valued, took its rise from combinations of this kind during the long residence of the Moors in that kingdom.

Dom Pedro IV, King of Castile, was the first Prince who introduced the good kind of sheep which they now have in Spain, by bringing thither the Barbary breed. In two ages, they began to decline; when Cardinal Ximenes restored the breed, by procuring a fresh supply of rams from Barbary, that is to say, of rams bred by the Arabians there; by exciting amongst the

(a) *De re rustica*, Lib. VII. c. ii.

people an emulation which continues to this day; and by fixing their attention to this object, which has hitherto preserved the goodness of the Spanish wool*.

The memoirs of the Royal Society of Agriculture at Rouen say (*b*), that in the fifteenth century, our Edward IV obtained a number of this race from the king of Castile, which throve very well, and laid the foundation of the excellency of our wool. Henry VIII, and Queen Elizabeth, contributed much to it's perfection, by directing the attention of government to this great national concern. Men of distinguished judgment and integrity were commissioned to superintend the proper distribution and future care of the Castilian sheep. How this commission has since come to be neglected, I know not. These commissioners sent two Castilian ewes and one ram to every parish in which the pasture was thought proper for them; and the care of them there was intrusted to the yeomen and most considerable farmers, to whom peculiar privileges were at the same time granted on this account. Farther, in order the sooner to have a quantity of good wool, the finest native ewes were also singled out, and covered by the Spanish rams, from whence proceeded a bastard race, much superior in quality to those of the country. Shepherds were taught the art of managing

* The finest of the Spanish wools are those of Castile, which are divided, according to the places of their growth, into Segovians, Leonisas, Segovias, Sorias, and Molinas. The wools of Arragon are less fine: these are Albarazins, fine and middle, the Campos, and the black wool of Saragossa. Portugal and Navarre produce also fine wools: Our imports of wool from Spain have generally been of the prime of the Castilian, used in making our finest cloths.

(*b*) *Tome II. p. 58.*

sheep, and written instructions were given them, which, I am sorry to say it, are now lost (+). At

(+) Dr. Campbell, in his very valuable *Political Survey of Great Britain, Vol. II, p. 151*, treats the whole of this account of Edward the Fourth's, or any other of our Kings procuring sheep from Spain, to renew or improve our breed, as a mere fiction, invented by P. Chomel, in his *Dictionnaire Oeconomique*, to shew how easily such a scheme might be executed in France; and I confess that the Doctor's arguments seem to me next to absolutely conclusive against it: indeed, if it rested solely upon the credit of Father Chomel, I should not hesitate a moment to pronounce him right. But as it comes to me from an infinitely more respectable quarter, from a society justly revered by the whole world, some of whose members are nobles of the first distinction, and others highly eminent for their great knowledge, I cannot suppose them to have taken this upon trust from the Dictionary-writer, or to have advanced it as a fact, without better authority than his for their so doing. The Gascon and Norman Rolles, published by the late Mr. Carte, are a proof, not to mention several more which might be instanced, that there may still be in France, and particularly in those parts of it which once were subject to us, records relative to our history which we are yet unacquainted with; and it is not impossible that the anecdote here alluded to may be one of them, even though the name of the prince, and the date, may be mistaken. However, I speak here only from surmise.—Let me now use an argument which may possibly be more striking. The Doctor himself, adopting the opinion of those who think that the Northern parts of this island were peopled from Germany, the Southern from Gaul, and the Western and Ireland from Spain, says, p. 150. “it cannot be doubted, that as
“the inhabitants of Britain and Ireland, so the sheep also
“came originally hither from some other country, and most
“probably, for many reasons that might be assigned, from
“Spain.—This seems to be confirmed by the breed being the
“same in both islands, and having a great resemblance un-
“to those of Spain.”—Now, with submission to the Doctor, to whose opinion I shall ever pay a sincere deference, is it any way unreasonable to suppose, that the breed of sheep imported into this island at the time of it's being first inhabited, might have degenerated, in the course of many centuries, so as to stand in need of a kind of renewal; and, in that case, could there be any more proper way than applying to the country from which the good breed first came? No matter which of our princes did it; or even whether it was not done at all. Some such expedient would be of service now to improve our present race.

this

this time began the custom of folding them in the warm kindly weather, and the same practice was afterwards continued during the winter. The abode of the Spanish sheep in England altered by degrees the nature of their wool; it became much longer, but did not continue so fine as before; owing, probably, to the difference of the pasture. Our wool is however whiter and cleaner than that of Spain, through the great care which the English take to keep their flocks free from filth; an attention hitherto neglected by the Spaniards.

To the above mixture of the Spanish sheep with the natives of this island, and the greater or less degeneracy of their posterity, is owing that we now see in England three sorts of sheep; the common, which are very small; the bastard, which are of a middle size; and the strong, fine and plentiful breeders.

The Gloucestershire, particularly those of Cotewold, the Herefordshire, Shropshire, and isle of Wight sheep, yield the finest wool of any in England: they are short-legged, and have commonly a black forehead or a black head. The Warwickshire, Leicestershire, Buckingham, and Lincolnshire sheep are the largest and best shaped, and their wool is the deepest of any we have, but not so fine as that of the former. The Yorkshire sheep are likewise pretty large, but their wool is coarse; and in general, that of all the Northern counties is long, but hairy. The Welsh sheep are the smallest of all, and their wool is by no means the finest; but in return their flesh is excellently well flavoured. The wool of the Castilian sheep is undoubtedly much finer than that of even the best English; but it is less in quantity, chiefly because the sheep themselves are smaller: though there are in some
parts

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parts of Spain sheep larger and covered with more wool than any of the English. For their wool, the English are certainly the next best to the Spanish.

The Irish wool in general, but especially in Limerick, Kilkenny, Kerry, Waterford, Cork, and some other counties, is of the fine long combing kind, scarcely surpassed by any of the sort in England. This is the wool that is most acceptable in foreign parts, where they have short wool enough of their own, or may easily procure it from Spain and Portugal.

In the last century, the Dutch brought from the East-Indies a race of tall sheep, long and thick in the body, with wool proportioned to the stature of the animal. This valuable breed has succeeded beyond expectation in the island of the Texel and in East-Friesland. One of these sheep yields a fleece of from ten to sixteen pounds of a fine silky wool, which the Dutch sell for English wool.

The Flemings also procured some of the same sort of sheep, which they breed about Lisle and Varneton, where they thrive well, and are known by the name of Flemish sheep.

The largest of these sheep are six feet long from head to tail. In Holland, they give four lambs in the year; whereas in Flanders they bring but two, of which the strongest is reared in order to keep up the flock. Each of these likewise yields as far as sixteen pounds of wool. They would be preferable to those of the Texel, if the same care was taken of them, and if they were more numerous than they are. Most of the sheep about Lisle are a bastard race proceeding from the Indian rams and the ewes of the country, and yield from six to ten pounds of wool, little inferior to that of the true breed. Their

Their flesh is well-tasted and wholesome: a carcass of it weighs from ninety to an hundred and twenty-five pounds, and yields about thirty pounds of suet. They are in themselves the finest, largest, and strongest of any sheep. They require, indeed, a larger quantity of food; but on the other hand they are indifferent in regard to it's quality: they are easily taken care of, naturally healthy, and if sick easily cured. Their wool differs little from that of England, only it does not so easily take fine colours. It is not so fine as it might be, for several reasons, the principal of which are, that they are seldom folded; that they are kept too warm in their houses during the winter; that their litter is not changed often enough, whereby it not only dirt, but also gives a bad smell to their wool; and that sufficient care is not taken to keep them from hedges, bushes, and brambles, which not only tear off their wool, but scratch their skin, which, if not healed in time, degenerates into the scab.

The Swedes, after having tried in vain to mend the breed of their sheep in the reign of queen Christina, sat the same design again on foot in the year 1725. They imported into their country a number of the best kinds of sheep from England and Spain, and put them under the management of skilful shepherds, to be treated according to their several natures. After the example of England, heretofore, they established schools for training up shepherds, who were sent from thence to the different parts of the kingdom; and those schools are continued to this day. They put the foreign rams to their native ewes, and from thence proceeds a valuable bastard race. By this care, Sweden now has, notwithstanding the rigour of it's climate, wool which nearly resembles the English and Spanish.

The

The French have, in several parts of their kingdom, numbers of sheep of the true Spanish breed, and they multiply there exceedingly; so that, as the authors of the *Maison rustique* observe (c), it might be easy for them, by following the method formerly practised in England, to establish every where that race, which would yield twice or thrice as much profit as their own common sheep, as well in point of size, of the goodness of their lambs and rams, of fruitfulness, and of milk, as of the quantity and quality of their wool and skins.

The provinces of Berry and Beauvais are those in which the most and best sheep in France are reared. Those of Beauvais, and some other parts of Normandy, are the largest, and the fullest of fuet. In Burgundy, they are very good; but the best are those that feed on the sandy coasts of the maritime provinces of France. In Poitou, Provence, the neighbourhood of Bayonne, and some other parts of France, there are sheep which seem to be of a foreign breed: they are stronger, larger, and have a great deal more wool than those of the common breed. These sheep are also more prolific than the others; it being nothing extraordinary for them to have two lambs at a time, and to year twice a year. The rams of this breed, engendering with the common ewes of the country, produce an intermediate breed, partaking of the two from which it proceeds.

Some think that the present Italian sheep are the offspring of a mixture of the Asiatic and the European kinds. But be that as it may, there are in the Bressan (d), towards Mantua, sheep whose wool is indeed coarse, but of so quick

(c) *Tom. I, Part I, Liv. iv, c. 3.* (d) *Ibid, Tom. I, p. 348.*
growth

growth that they are sheared three times a year, namely, in March, in July, and in November. It is true, they would not yield so great a quantity of wool in cold countries; but in warm ones they will, every where; and yet they are of so robust a constitution, that they fear neither rain, cold, nor even hoar frosts, but will feed at all times in the open field, provided the ground be not covered with snow. They yield plenty of milk during four or five months of the year, and excellent cheese is made with it. Another kind of Brescian sheep, called bastard sheep, but for what reason I know not, bears shearing twice a year, and is much esteemed, though smaller than the former. But the finest wool of all Italy proceeds from that kind of sheep which the Brescians call *gentili*, and of which numbers are fed in the Trentin, especially about the villages of Ghede and Montechiaro: but as these sheep are extremely difficult to rear and take care of, and as the fineness of their wool is owing to the climate and pasture of the country, they probably might not thrive elsewhere.

The wool of the Russian, Polish, and Tartarian sheep, is better than that of the common German sheep; and accordingly the Swedes make use of it in their manufactures of cloth, stockings, &c.

All the above-mentioned sorts of sheep certainly form but one greatly-diversified species, which in M. de Buffon's opinion (e) hardly extends beyond Europe: for as to those long and broad-tailed creatures so common in Africa and Asia, and to which travellers have given the name of *Barbary sheep*, they seem to him to

(e) *Histoire Naturelle de la Brebis.*

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be of a different species from our sheep; as do like the American vigonia and lama.

Daily experience proves that the European sheep in some degree alter their very nature; for instance, in Lincolnshire they are large, heavy, and slow in their gait. On the downs of Suffex, Wiltshire, and Dorsetshire, they are smaller, more hardy, and fleet; and in the mountains of Wales they are still less of size, and so active as scarcely to be confined by any inclosures. If we extend our view farther, we shall find, that the kind which yields the softest and finest wool in Britain, when sent to the West Indies becomes hairy like a goat. It is also observed in North America, that the quality of their wool depends much on the temperature and climate of the country: in some of the middle provinces, such as New York, the Jerseys, &c. their wool is of so good a quality, that a sample of it sent hither some years ago sold for as high a price as our best; although this was only from a common tobacco-plantation, where no care had been taken of it since America was first settled *.

(*) The fact here alluded to is mentioned in *The Present State of America*, p. 142; allowed by Sir J. Dalrymple, in his *Political Essays*, *Sett. I. Colonies*, p. 263; and confirmed by a letter to the writer of this work from an eminent merchant in New York, who says positively, "our wool in general is better than the English: but how small is the quantity we raise! It is true, some late oppressive acts, as the sugar-act, stamp-act, and new duty-act on glass, paper, &c. raised a spirit in the country for manufactories, and doubled the number of sheep; but I affirm, that our wool was not a quarter part sufficient for our consumption. I have taken pains to get an account of the number of sheep in New Jersey; and as they were formerly taxed, I believe it just, and that the whole number does not exceed one hundred thousand. These, at an average, yield about $2\frac{3}{4}$ lb. each, which is sold for about fifteen pence sterling a pound. This quantity will be under $3\frac{1}{2}$ lb. per head,

“ head, for apparel and bed-clothes, and not near sufficient for their demand. The country-people, indeed, mix linen-yarn in their cloth, which helps out, and makes it very strong; yet, though every pound is worked up, the towns, villages, and iron-works cannot be supplied, and depend on English cloth and stuffs. I think Pennsylvania keeps still fewer sheep. It is true, Long-island and the islands in the Sound greatly exceed: but then the northern parts of the colony of New-York keep much fewer; so that, on the whole, they are not equal to Jersey.

“ I have found from experience that no farming is more profitable than sheep, and now keep an hundred and fifty on the same farm where my predecessor kept but twenty-five. I estimate the profit from eight to ten shillings a head *per annum*, and this on land that rents at two shillings sterling *per acre*. I would willingly increase my flock, but find my farm will not bear it; though, on four hundred acres of arable and meadow land, I only keep besides, eighteen head of cattle, thirty hogs, eight horses, and plough about eighty acres for summer and winter grain. I winter, indeed, thirty head more of young cattle which I summer in the woods. The smallness of this stock will surprize a British farmer: but our fields do not yield like those of England; owing to our cold springs and hot summers, long droughts and heavy rains, bad husbandry and want of manure.

“ To what I before said of our not having a sufficient quantity of wool, I will now add the prices which I actually paid for manufacturing a piece of cloth, three quarters of a yard wide.

	New York Currency	£.	s.	d.
“ Spinning 23 $\frac{1}{2}$ lb. of wool, at 3s. 6d <i>per lb.</i>		4	2	0
“ Weaving 34 yards of cloth, at 1s —		1	14	0
“ Fulling, pressing, and dyeing 25 yards at 1s 6d — —		1	17	6
“ Wool 23 $\frac{1}{2}$ lb. picked and cleaned, at 2s 6d		2	17	9
		£	10	11 0

“ Which is 8s. 5d. Currency, or near 5s. sterling *per yard*.

“ The cloth, after a few days wear, looked very indifferent. I had it made up for myself, as most of the gentlemen here pique themselves in setting an example of wearing country-made cloth; but we were under a necessity of buying English cloth for our negroes. The restrictions being taken off our trade, we are returned to wearing

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“wearing English cloth, and hope like causes will not
 “oblige us to recur to the same resolutions.—We are now
 “convinced that we cannot hire to make cloth under almost
 “double what the English does cost: but at the same time
 “farmers who have the labour done within themselves, and
 “by this means employ the women, who would otherwise be
 “idle, will always make cloth for themselves with advantage;
 “especially as it is said to wear better: but we have
 “not the least prospect of making a yard for exportation.”

—This letter was written in December, 1773; the facts related in it may be depended on; and the writer of this work most sincerely wishes, that the long and literal extract of it here given may tend in any sense to rectify the mistaken opinions now, unhappily, too prevalent.—Such is his reason for inserting it here.

C H A P.

C H A P. II.

Of the Management of Sheep.

AS the size and welfare of the sheep, and the goodness of their wool, depend much on the nature and quality of their pasture, this becomes an article of the utmost importance to the husbandman, and therefore deserves a particular inquiry.

In order to their being rightly managed, the owner should be very careful what kind of shepherd he entrusts his sheep to: for the shepherd not only accompanies them to the field, but should also take care that they do not feed in improper places; improper, on account of the quality of the food and drink, as well as other dangerous circumstances. He should likewise be particularly attentive that no improper rams mix with the flock; to give immediate relief to those that fall sick, especially in lambing-time, and for this reason he should be well acquainted with their diseases. In short, his presence and care should be so constant, that the sheep shall obey him out of a kind of love. He should be vigilant and circumspect, govern them with great clemency, and says Columella (a), who strictly enjoins the same rule to the keepers of all

(a) *Lib. VII. c. iii.*

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sorts of cattle, be more like a captain and leader than a lord and master. When he threatens them, it should be with a loud shout and shaking his staff at them; but he never should throw any offensive weapon at them, nor remove to any great distance from them; neither should he lie down, or sit down, but, unless he be going forward, he should stand, to be the better able at all times to look around him, to see that neither the slow and big with young, whilst they loiter, nor the nimble, whilst they run before, be separated from the rest, lest either a thief or a wild beast deceive the heedless inattentive guardian.

We find by Columella, that it was an early custom to lead sheep to far distant pastures at different seasons of the year; and the Spaniards have still retained this practice, as will appear from the following abridgement of a judicious account of their manner of managing the royal flocks, transmitted by a gentleman in Spain to the late Mr. Peter Collinson, F. R. S.

“ There are two kinds of sheep in Spain,
 “ namely, the coarse-woolled sheep, which remain
 “ all their lives in their native country, and which
 “ are housed every night in the winter; and the
 “ fine-woolled sheep, which are all their lives in
 “ the open air, which travel every summer from
 “ the cool mountains of the northern parts of
 “ Spain, to feed all the winter on the southern
 “ warm plains of Andalusia, Manca, and Estremadura. It has appeared from very accurate
 “ calculations, that there are not fewer than five
 “ millions of fine-woolled sheep in Spain; and
 “ it is reckoned that the wool and flesh of a flock
 “ of ten thousand sheep produce yearly about
 “ twenty-four reals a head, which we may sup-
 “ pole

“ pose to be nearly the value of twelve six-pences
 “ sterling*.

“ Special ordinances, privileges, and immu-
 “ nities are issued for the better preservation and
 “ government of the sheep, which are under
 “ the care of twenty-five thousand men, who,
 “ as the Spaniards express it, cloath kings in
 “ scarlet, and bishops in purple.

* Of these, but one clear a head goes to the owner yearly; three six-pences a head go yearly to the king, and the other eight go to the expences of pasture, tythes, shepherds, dogs, salt, sheering, &c.—Thus the annual produce of five millions of sheep amounts to thirty-seven millions and a half of six-pences, a little more or less, of which about three millions and an half are for the owners, above fifteen millions enter into the treasury, and seven millions and a half go to the benefit of the public. Hence it is that the Kings of Spain call these flocks, in their ordinances, *The precious Jewel of the Crown*.

Formerly, this jewel was really set in the crown; for a succession of many kings were lords of all the flocks: thence that great number of ordinances, penal laws, privileges, and immunities which issued forth in different reigns for the preservation and special government of the sheep. Hence a royal commission was formed under the title of The Council of the grand royal flock, which exists to this day, though the King has not a single sheep. Various exigencies of state, in different reigns, alienated by degrees the whole grand flock from the crown, together with all it's privileges, which were collected and published in the year 1731, under the title of “ Laws of the royal Flock;” in a large folio, of above five hundred pages.

The wars and wants of Philip the First's reign, forced that King to sell forty thousand sheep to the Marquis of Iturbietta, which was the last flock of the crown.

Ten thousand sheep compose a flock, which is divided into ten tribes. One man has the conduct of all. He must be the owner of four or five hundred sheep; strong, active, vigilant, intelligent in pasture, in the weather, and in the diseases of sheep. He has absolute dominion over fifty shepherds and fifty dogs, five of each to a tribe. He chooses them, and chastises or discharges them at will. He is the *prepositus*, or chief shepherd of the whole flock.

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“ These sheep pass the summer in the cool
 “ mountains of Leo, Old Castile, Cuença, and
 “ Arragon. The first thing the shepherd does
 “ when the flock returns from the south to it’s
 “ summer-downs, is to give the sheep as much
 “ salt as they will eat. Every owner allows his
 “ flock of a thousand sheep twenty-five quintals
 “ of salt, which the flock eat in about five
 “ months: they eat none in their journey, nor in
 “ their winter-walk. It is believed, that if they
 “ stinted their sheep of this quantity, it would
 “ weaken their constitutions, and degrade their
 “ wool. The shepherd places fifty or sixty flat
 “ stones at about five steps distance from each
 “ other; he strews salt upon each stone; he leads
 “ the flock slowly through the stones, and every
 “ sheep eats to his liking. What is very remark-
 “ able the sheep never eat nor desire a grain of
 “ salt when they are feeding on land which lies on
 “ lime-stone: and as the shepherd must not suf-
 “ fer them to be too long without salt, he leads
 “ them to a spot of clayey soil, and after a quar-
 “ ter of an hour’s feeding there, they march
 “ back to the stones and devour the salt. So
 “ sensible are they of the difference, that if they
 “ meet with a spot of a mixed soil, which often
 “ happens, they eat salt in proportion †.

“ Towards the latter end of July, the rams
 “ are turned in among the tribe of ewes, regu-
 “ lated at six or seven rams for every hundred
 “ ewes; and when the shepherd judges that these
 “ have been served, he collects the rams into a
 “ separate tribe to feed apart. There is also

† This shews how favourable for sheep those pastures are
 which lie on lime-stone, or chalk, as most in England do;
 for in the south of this island there is chalk almost every
 where, and lime-stone abounds in the north-west.

“ another

“ another tribe of rams which feed apart, and
“ never serve the ewes, but are kept solely for
“ their wool and for the butchery: for though
“ the wool and flesh of wethers are finer and
“ more delicate than those of rams, yet the
“ fleece of a ram weighs more than the fleece
“ of a wether, who is likewise shorter-lived than
“ the ram: for these reasons there are but few
“ wethers in the royal flock of Spain. The
“ fleeces of three rams generally weigh twenty-
“ five pounds; and there must be the wool of
“ four wethers, and that of five ewes, to make
“ an equal weight. There is the same dispro-
“ portion in their lives, which depend on their
“ teeth: for when these fail, they cannot bite
“ the grass, and are of course condemned to
“ the knife. The ewe’s teeth begin to fail after
“ five years of age, the wether’s after six, and
“ those of the robust ram not till towards eight.

“ At the latter end of September they put on
“ the redding or ocre, which is a ponderous
“ iron earth, common in Spain: the shepherd
“ dissolves it in water, and dawbs the backs of
“ the sheep with it from the neck to the rump.
“ It is an old custom. Some say it mixes with
“ the grease of the wool, and so becomes a var-
“ nish impenetrable to the rain and cold; others,
“ that it’s weight keeps the wool down, and
“ thereby hinders it from growing long and
“ coarse; and others again, that it acts as an
“ absorbent earth, and receives part of the trans-
“ piration, which would foul the wool, and
“ render it harsh.

“ Likewise in the latter end of September the
“ sheep begin their march towards the low plains.
“ Their itinerary is marked out by immemorial
“ custom, and by ordinances. Their journies
“ are often so long, that the poor creatures go

“ six or seven leagues a day to get into open
 “ wilds, where the shepherd walks slow, to let
 “ them feed at their ease and rest : but they ne-
 “ ver stop ; they have no day of repose ; they
 “ march at least two leagues a day, constantly
 “ following the shepherd, till they get to their
 “ journey’s end. From the territory called the
 “ Montana, at the extremity of Old Castile,
 “ from whence they set out, to Estremadura, is
 “ an hundred and fifty leagues, which they
 “ march in less than forty days. The chief
 “ shepherd’s first care is to see that each tribe is
 “ conducted to the same district it fed in the
 “ year before, and where the sheep were yeaned,
 “ which they think prevents a variation in the
 “ wool ; though this requires but little care ; for
 “ it is a known truth, that the sheep would go
 “ to that very spot of their own accord. His
 “ next care is to fix the toils † (in England
 “ hurdles) where the sheep pass the night, lest
 “ they should stray, and fall into the jaws of
 “ wolves.

“ Next comes the time when the ewes begin
 “ to drop their lambs, which is the most toil-
 “ some and most solicitous part of the pastoral
 “ life. The shepherds first cull out the barren
 “ from the pregnant ewes, which last are con-
 “ ducted to the best shelter, and the others to
 “ the bleakest part of the district. As the lambs
 “ fall, they are led apart with their dams to ano-
 “ ther comfortable spot. A third division is
 “ made of the last-yeaned lambs, for whom was
 “ allotted from the beginning the most fertile

† The toils are made of Sparto, in meshes a foot wide,
 and the thickness of a finger. Sparto is a sort of rush which
 bears twisting into ropes for coasting vessels. It is so light as
 to swim ; whereas hemp sinks. The English sailors call it
 bofs.

“ part, the best soil, and the sweetest grass of he
 “ down, in order that they may become as vigorous
 “ as the first-yeaned; for they must all march
 “ on the same day towards their summer-quar-
 “ ters. The shepherds perform four operations
 “ upon all the lambs about the same time in the
 “ month of March; viz. they cut off their tails
 “ five inches below the rump, for cleanliness;
 “ they mark them on the nose with a hot iron;
 “ they saw off part of their horns, that the rams
 “ may neither hurt one another nor the ewes;
 “ and they emasculate the lambs intended for
 “ bell-wethers to walk at the head of the tribe.

“ As soon as April comes, the sheep express,
 “ by various uneasy motions, a strong desire to re-
 “ turn to their summer-habitations. The shep-
 “ herds must then exert all their vigilance to
 “ prevent their escaping; for it has often hap-
 “ pened that a tribe has stolen a forced march of
 “ three or four leagues upon a drowsy shepherd;
 “ and there are many examples of three or four
 “ strayed sheep walking a hundred leagues to
 “ the very place they fed on the year before.

“ In the summer sheep-walks I learnt that the
 “ three following opinions should be ranked
 “ among vulgar errors;

“ 1. That salt-springs are not found in the
 “ high mountains, but in the low hills and plains
 “ only.—The whole territory of Molina is full of
 “ salt-springs, and there is a copious one rising
 “ out of land higher than the source of the Ta-
 “ gus, and not far from it; which is one of
 “ highest lands in all the inward parts of Spain.

“ 2. That metallic vapours destroy vegeta-
 “ tion; and that no rocks nor mountains preg-
 “ nant with rich veins of ore are covered with
 “ rich vegetable soils.—There are many
 “ iron, copper, lead, and pure pyritous ores
 “ in these sheep-walks, where grow the same

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“ plants, and the same sweet grafs, as in the
“ other parts. .

“ 3. That sheep eat and love aromatic plants;
“ and that the flesh of those that feed on the
“ hills where sweet herbs abound has a fine taste.
“ —I have observed, that when the shepherd
“ made a pause, and let the sheep feed at their
“ will, they sought only for fine grafs, and
“ never touched any aromatic plant; that when
“ the creeping *serpillum* was interwoven with the
“ grafs, they industriously nosled it aside to bite
“ a blade of grafs; and that this trouble soon
“ made them seek out a pure gramineous spot.
“ I observed too, when the shepherd perceived
“ a threatening cloud, and gave a signal to the
“ dogs to collect the tribe and then go behind
“ it, walking apace himself to lead the sheep
“ to shelter, that, as they had no time to stoop,
“ they would take a snap of stæchas, rosemary,
“ or any other shrub in their way; for sheep
“ will eat any thing when they are hungry, or
“ when they walk fast. I saw them greedily
“ devour henbane, hemlock, glaucium, and
“ other nauseous weeds, upon their issue out of
“ the sheering-house ||.

|| Mr. Collinson's correspondent observes very justly on this occasion, that if sheep loved aromatic plants, it would be one of the greatest misfortunes that could befall the farmers of Spain; for that the number there is incredibly great, and the bees suck all their honey, and gather all their wax, from the aromatic flowers which enamel and perfume two thirds of the sheep-walks.—He assures us, that he himself knew a parish-priest who had five thousand hives, and whose method was cautiously to seize the queens in a small crape fly-catch, and then clip off their wings. This obliged their majesties to stay at home; and he declared, that he never had lost a swarm from the day of this discovery to the time of his relating this, which was five years.—I mention this circumstance the more readily, because I do not recollect having noticed it in my *Treatise on the Management of Bees*, where it ought to have been.

“ The

“ The shepherd’s chief care now is, not to
“ suffer the sheep to go out of their toils till the
“ morning-sun has exhaled the dew of a white
“ frost, and never to let them approach a ri-
“ vulet or pond after a shower of hail; for if
“ they should eat the dewy grass, or drink hail-
“ water, the whole tribe would become melan-
“ choly, lose all appetite, pine away and die; of
“ which there have been frequent instances*.

“ The sheep of Andalusia, which never tra-
“ vel, have coarse, long, hairy wool. I saw some
“ in Estremadura whose wool trailed on the
“ ground. The itinerant sheep have short, silky,
“ white wool; the fineness of which is owing to
“ the animal’s passing its life in the open air, of
“ equal temperature; for it is not colder in
“ Andalusia or Estremadura in the winter, than
“ it is in the Montana or Molina in summer.
“ Constant heat, or constant cold, with housing,
“ are the causes of coarse, speckled, black
“ wool: and I do believe, from a few experi-
“ ments and long observation, that if the fine-
“ woolled sheep stayed at home in the winter,
“ their wool would become coarse in a few ge-
“ nerations; and on the other hand, that if the
“ coarse-woolled sheep travelled from climate to
“ climate, and lived in the free air, their wool
“ would become fine, short, and silky likewise
“ in a few generations.

“ All the animals that I know of, who live
“ in the open air, constantly keep up to the co-
“ lour of their fires. There are the most beau-
“ tiful brindled sheep in the world among the

* Hail-water is likewise so pernicious to men in the climate here spoken of, that the people of Molina will not drink their river-water after a violent shower of hail; experience has taught them the danger: but let it be never so muddy, and rise never so high after rain, they drink it without fear.—Perhaps this may be the unheeded cause of many epidemics in other cities.

“ coars-

“ coarse-woolled sheep of Spain. I never saw
 “ one among the fine-woolled flocks : the free
 “ but less-abundant perspiration in the open air,
 “ is swept away as fast as it flows ; whereas it is
 “ greatly increased by the excessive heat of
 “ numbers of sheep housed all night in a nar-
 “ row place. It fouls the wool, makes it hairy,
 “ and changes it's colour.—The swine of Spain,
 “ who pass their lives in the woods, are all of
 “ one colour, as the wild boars. They have
 “ fine, silky, curled bristles. Never did a
 “ Spanish hog's bristle pierce a shoe.—What a
 “ quantity of dander is daily scoured from the
 “ glands of a stabled horse ; the curry-comb
 “ and hair-cloth ever in hand ! How clean is
 “ the skin of a horse that lives in the open air !

“ The shepherds begin to shear their sheep
 “ on the first of May, provided the weather be
 “ fair : for if the wool were not quite dry, the
 “ fleeces, which are close piled one upon another,
 “ would rot. It is for this reason that their
 “ sheering-houses are surprizingly spacious. I saw
 “ some large enough to contain twenty thousand
 “ sheep in bad weather, and which cost above
 “ five thousand pounds sterling. Besides, the
 “ ewes are creatures of such tender constitutions,
 “ that if they were exposed immediately after
 “ sheering, they would all perish.

“ An hundred and twenty-five sheermen are
 “ employed to shear a flock of ten thousand
 “ sheep. One man sheers twelve ewes a day,
 “ and but eight rams. The reason of this dif-
 “ ference is, not only because the rams have
 “ larger bodies, stronger, and more wool ; but
 “ also because the sheermen dare not tie their
 “ feet as they do those of the unresisting ewes,
 “ Experience having taught, that the bold re-
 “ bellious ram will struggle, even to suffocation,
 “ when held captive under the sheers, they

“ gently

“ gently lay him down, stroke his belly, and
“ beguile him out of his fleece. A certain num-
“ ber of sheep are led into the great shelter-
“ house, which is a parallelogram of four or five
“ hundred feet long and an hundred wide, where
“ they remain all night, crowded as close toge-
“ ther as the shepherd can keep them, that they
“ may sweat plentifully, which, say they, softens
“ the wool for the sheers, and oils their edges.
“ They are led by degrees, in the morning, into
“ the spacious sheering-hall, which joins the
“ sweating-room. The shepherd carries them
“ off as fast as they are shorn, to be marked
“ with tar: and as this operation is necessarily
“ performed upon only one at a time, it gives a
“ fair opportunity to the shepherds to cull out
“ for the butchery all the sheep of the flock
“ who have out-lived their teeth. The sheered
“ sheep go to the fields to feed a little if it be
“ fine weather, and they return in the evening to
“ pass the night in the yard before the house,
“ within the shelter of the walls; but if it be cold
“ and cloudy, they go into the house, and are
“ thus brought by degrees to bear the open air.”

The above, or a similar practice, might be followed to advantage by the counties which border on Wales, or on the Grampian hills in Scotland: for in both those countries there is summer-pasture for a much greater number of cattle than they can maintain in the winter. In both, the pasture is not only dry and healthy for sheep, but they would likewise thereby avoid the great summer-heats to which they are at times exposed, even in this moderate climate.

In dry and high grounds, where the herbage is thick and fine, the sheep are much more healthy, and their flesh is of a much finer flavour than that of those which are fed in moist vallies and

low plains; unless those vales be sandy, or very dry, or near the sea. These last are, indeed, the best of all, because the herbage there is naturally sprinkled with salt. Also the ewes fed on them yield more milk, and of a better taste.

Sheep should not, if possible, be suffered to feed on low moist grounds, or such as have been lately drained, unless these are become very dry; and even then it should be only in the middle of the day. Grounds over which mineral or hard waters run are also prejudicial to them; as is likewise grass in which the webs or eggs of grasshoppers, or other insects, are found; or in which the dung of rats or field-mice lies. When sheep are forced to feed on such pastures, it is advisable to rub their mouths frequently with salt, and to have salt laid for them in vessels, where they will greedily lick it one after another; for they are remarkably fond of salt, and nothing is more healthful when given in moderation.

The world is greatly indebted to the celebrated Linnæus for the inquiry which he has excited in regard to such plants as are agreeable or hurtful to each domestic animal. He has observed, in a dissertation intitled *Pan Suecus* (g), that sheep eat 387 sorts of Swedish herbs and plants; and that they leave 141 of them untouched, as being hurtful, or less nourishing, and therefore less suitable to their nature.—A similar account of our English plants might be of great service to our husbandmen and owners of land, especially to such as are concerned in grazing.

Among other interesting observations, Linnæus remarks (b), that the milfoil, or yarrow, is a food which sheep are particularly fond of; and I have been told by a gentleman who had been

(b) Page 387.

(c) *Pan Suecius*, page 95.

at much pains to clear his ground of this plant, that having turned some sheep into a field where there yet remained a good deal of it, he was greatly surprised at finding the next day that the sheep had scarcely left a plant of it, but had eaten it quite down to the ground. He then lamented his former industry, and laid down as an easy rule, by which every one may judge what plants are most agreeable to different animals, to observe which are those that they prefer on being turned into a fresh pasture, or what are the plants in common pastures which the creatures feeding there never suffer to rise to seed. Thus the milfoil never runs to seed but in places where sheep cannot get at it. It is the same with the chamomile, though so bitter a plant, and with the narrow-leaved plantain or ribwort. These plants have another advantage attending them with regard to sheep, which is, that as they strike deep roots they retain their verdure the longer, and therefore deserve to be carefully cultivated by those who have flocks of sheep.

Burnet has, on all occasions, been found to be peculiarly pleasing and healthful to sheep. An instance of it's being both happened to a gentleman of my acquaintance in the year 1766; the summer of which being extremely wet, sheep in general were much afflicted with the rot. This gentleman, very attentive to rural œconomy, bought some sheep in the autumn of that year, which he put into a field of burnet, and killed them during the winter, as his family-consumption required. Every one of them was found to be in a perfectly sound state; whilst every sheep belonging to a neighbouring gentleman, and which had been part of the same flock, which was Welsh, was diseased. It was very remarkable too in these last sheep, that, though
they

they had plenty of grafs and turnips, they could not be confined; but the moment they were put into the field of burnet belonging to the former gentleman, they became perfectly quiet, and never endeavoured to stir from thence, though the gate was left open.

The common opinion that sheep hurt lucerne in the autumn by biting it too close, is without foundation; for the spring-shoots have no communication with those that remained in the autumn, but are quite fresh shoots issuing from the crown of the root. Lucerne is an excellent food for all sheep in the autumn, and particularly so for ewes and lambs in the spring.

Clover is a very succulent food for sheep, and these creatures are extremely fond of it; but if the shepherd is not attentive, it may prove dangerous to them. He should always turn them into the clover with their backs to the wind, and not leave them too long in it. It is said by some, that the wind mixing with the clover, which they swallow greedily, swells them, and makes them die in a few hours: others believe that it is the venom of the reptiles which this plant attracts, that occasions these pretty frequent accidents: but, in truth, the cause of this swelling is undoubtedly the same as was before assigned for the hoving of cattle; and accordingly the remedy directed for it by the Royal Society of Agriculture at Rouen is, as soon as this misfortune is perceived to have happened to some of the flock, to throw cold water over their bodies, if it be at hand, or to pen them up so closely as to make them press strongly one against another. This will restore them to their natural state.

Sheep likewise readily eat turnips, and thrive upon them, when they have been accustomed to them early; but they do not relish this food when it has not been offered to them till after they

they are grown old: however, if they are kept fasting two or three days, most of them take to it; and when they have once tasted it, they become fond of it, and feed very kindly upon it. In some places people feed their lambs with turnips till the middle of April, though they then begin to run up to feed. Some parboil them a little at first, till their cattle, and particularly their sheep, are accustomed to them: but a lamb only three weeks old will, after it has once eaten of this food, scoop out a raw turnep with great delight. Parsley corrects the inconveniencies which may arise from the too-great moisture and coldness of the turnips, and therefore should be given them in plenty when they are feed upon this root. The sheep also are fond of it.

Carrots are another excellent food for sheep, and these creatures are remarkably fond of them. One acre of these roots, well planted, will fatten a greater number of sheep, or bullocks, than three acres of turneps, and their flesh will be firmer and better-tasted. Parsnips are also another excellent and profitable food for them.

It is a custom in most countries, especially where the verdure of the grass is not so constant as in Britain and Ireland, to collect the leaves of trees during the summer, or before they turn yellow, for feeding all kinds of cattle, and particularly sheep; and when these are mixed with their hay, they have a good effect. Straw, especially of oats, cut and mixed with their hay, is also recommended during the winter. The bark of the branches of the fig-tree, and it's buds, are likewise mixed with their hay in countries where that tree abounds.

It is undoubtedly most healthy for sheep to range at large; but as that is not in the power of every one, they should at least be kept as airy as possible.

We

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We are so happy in the mildness of our climate in England, and in our safety from wolves, that our sheep lie out of doors all the year. Yet I cannot help thinking that they would be greatly benefited if there were at least sheds under which they might retreat in stormy weather: for though sheep are well cloathed by nature, yet when the rain is so constant and heavy as to soak through their fleeces, they become quite chilled, and that damp cold in them is frequently the cause of many disorders. It is said, that when they are enclosed in the narrow compass of a fold, they cherish one another by their mutual warmth: but this cannot give relief to the damp which each of them feels.

In climates less fortunately circumstanced than ours, the sheep are housed in winter, and fed chiefly with dry fodder. They are led out every day, unless the weather be very bad, though this is rather to air and walk than to feed them. In winter it should be near ten in the morning before they are led out, and they should be brought back again early in the evening, after having had an opportunity of drinking. In spring and autumn they are led to pasture as soon as the sun has dispersed the hoar-frost or dew on the grass, and continued there till sun-set. It is sufficient that they drink once a day in these seasons; and when brought back they should find fodder, though in less quantity than in winter. It is only during the summer-months that they can live entirely on the pastures, and they should then have water in their power twice a day. They may in this season be let out early in the morning; and in very warm weather they should be led to cool or shadowy places during the mid-day heat, which is found to be remarkably prejudicial, disordering their heads, and throwing them into

verti-

vertigoes. In very hot countries, Columella advises, that they be led in the morning so that their backs be turned to the sun, and in the evening so that the head may be shaded by the body.

Many people doubt whether it be more profitable to fold sheep, than it is to let them range a field at large both night and day; on the principle that their dung and urine are in either case pretty equally spread over the surface of the ground. Custom has, however, given it in favour of folding; and I believe it will be found, that if equal numbers of sheep are confined during the same time in two fields, that in which they are folded will be the most effectually and most regularly dunged; and therefore I must incline to prefer folding.

In the heat of summer, the fold should be large enough to admit of the sheep lying at a moderate distance from each other; for, even in the open air, a great heat is generated by the sheep when forced to be close together; and more than an ordinary degree of warmth should be avoided at all times. As the weather becomes colder, the extent of the fold may be diminished: but special care should be taken never to pitch it in a damp place, particularly in rainy weather, or winter; for nothing is so prejudicial to sheep as their being laid wet. On this account it is that in Sweden, since the late regulations there, they have in some provinces a kind of covered fold going upon wheels, so that it can be moved from one place to another: and I am persuaded, that if this practice was introduced into England, especially in rich low pastures, a considerable advantage would attend it, particularly in preventing the rot and purging which sheep are liable to in wet weather.

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Where the great degree of cold, or any other cause, renders it necessary to house sheep in the winter, their cotes should be built on a dry spot; the sheep should have sufficient room in them, and openings should be made in the upper parts to carry off the heated air: they should not, on any account, be made too warm, nor should the dung and litter ever be suffered to rise too high in them. The racks for the sheep should never be fixed to the wall, but hang from the roof, so that they may be raised or lowered at pleasure. They should never hang too high; because when the sheep are obliged to raise their heads too much, little bits of their food are apt to fall among their wool, which they intangle, and also in their eyes; where they bring on inflammations, and sometimes blindness. The rack should therefore not be higher than the flanks of the sheep. The roof of the cote should be covered with laths rather than with straw, or other such material, because the dust, chaff, or insects falling from these last would damage the wool. Spiders especially are very hurtful to sheep. The Swedes are so particularly careful in this respect, that they even white-wash the walls of their sheep-cotes.

When the winters are very severe, or the sheep are in great danger from ravenous animals, it becomes necessary to lodge them in houses, or cotes, during the winter (*d*). Such cotes should be built in dry and airy places, free from springs, and from the coming in of water any other way. Whilst the sheep are housed, great care should be taken that the cotes be not kept so close as to render the air in them too warm, and that the

(*d*) *Memoires de la Societ  Royale d'Agriculture de Rouen*, tom. ii.

sheep have very sufficient room to lie down. In order to secure them from too much heat, the best way of admitting a supply of fresh air will perhaps be by windows in each end, near the roof; for it is known that the heated and putrid air ascends, and therefore it will be discharged by these windows; for there will be a constant current of air from the one to the other, as the wind shall happen to set. The sheep will, by this means, be kept cool, without having openings through which the wind would blow upon their bodies partially, and thereby occasion coughs and colds, as every one can testify from his own experience.

The proportion of space which Mr. Hastfer, an ingenious Swede, advises (*e*) as a rule in building these sheep-cotes, is to allow six feet square for each sheep*; the height should be proportioned to the extent of the building, and to the number of sheep; but there must be at least ten feet between the floor and the roof, so that when the depth of dung and straw shall amount to four feet, there may still remain an height of six feet for the heat to ascend in: for when the hot exhalations of the sheep have not sufficient room to ascend, they return back, and fall upon the lungs of the sheep, open their pores, and make them sweat more than ever. Consequently great care should always be taken to make these buildings high enough, and large enough to prevent such immoderate heat. †

(*e*) *Manière d'élever les Bêtes à Laine. Part ii. c. 2. § 2.*

* Three Swedish ells, says he, which make very near six of our feet; the Swedish ell being exactly $23 \frac{3}{1000}$ inches English measure.

† A cote twenty feet square is large enough for thirty sheep; and a cote sixty feet long and thirty feet wide is sufficient for an hundred and fifty sheep, including rams and

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A cote twenty feet long should be ten feet high; that is the proportion for small cotes: but to twenty feet more in length there must always be added two feet more in height; that is to say, that for forty feet of length there must be twelve feet of height, and so in proportion for larger sizes.—The breadth is generally half of the length: that is the best symmetrical proportion, and gives the greatest strength to the roof: though Mr. Hatsfer would have them rather exceed the above dimensions in point of height, because that contributes greatly to keep the air purer than it would otherwise be, and nearer to the temperature of a cool summer's day, or a fine clear day in autumn, which is the degree of warmth most to be desired, and that for the following reasons in particular:

“ 1. In the spring, when the cold is greater abroad than in the cote, it is wrong to keep the cote too warm, because the sudden change from heat to cold is too sensibly felt by the sheep, has an influence on their blood, and necessarily affects their strength and health.

“ 2. In winter, the sheep, by passing suddenly from hot to cold, and from cold to hot, cannot but get coughs.

“ 3. It is plain, that if too great perspiration is hurtful to sheep in summer, when fresh grass gives them the most strength, it must be much more so in winter, when they eat only dry hay, or even straw, which affords them less strength, and less nourishment; especially as the heat, which ought to prevent, or at least moderate,

lambs. Any one may of course form his calculation from hence. HASTFER, *Manière d'élever les Bêtes à Laine. Part. ii. p. 41.*

the

the bad effects of the superfluous humours, is at the same time evaporated and wasted.

“ 4. The heat which penetrates through the pores into the gross winter’s wool, makes it grow too much : now this wool is not only of less value than the other good wool which the sheep is to keep till shearing-time ; but it falls off of it’s own accord as soon as the sheep pass from the cote into the cold spring-air ; and then this loss of their wool causes illnesses in them, and even death.

“ The floor of the sheep-cote should be paved either with stones, or with bricks or clinkers, and raised a little archwise in the middle, in order that the urine of the sheep may run off easily on all sides through small holes made for that purpose at the bottom of the building. Some cover this floor with earth, and others with sand, to the depth of five or six inches, in order that the urine of the sheep may soak into it, and thereby render it fit for manuring of land.— The floor itself may indeed be made of sand, as is the practice of some ; and in that case, instead of raising it in the middle, it should be somewhat lower there, in order that the urine may penetrate thoroughly into the sand ; and when it is sufficiently impregnated, it is covered with new sand, or thrown out of the cote with the dung of the sheep, and laid up in a heap for manure.

“ It is likewise to be observed, that of whatever height the cote may be, the dung in it should never be suffered to increase to more than four feet deep : for which reason the sides of the cote should be lined with wood to that height in the inside. The cote should be more or less high in proportion to the number of sheep kept

in it; for by this means the heat will be more or less great, as it will rise to a greater or less height.

“ In whatever manner the floor of the cote is made, it should always be covered with fresh straw before the sheep are put into it; as well for their pleasure as for their health. By this means too their wool is preserved from filth; and when the floor is made of wood, as is also the way of some, the straw preserves the sheep from having their skin or their flesh hurt by splinters, or their wool by turpentine in the boards, especially if of deal. This straw must be removed from time to time, and in some cases pretty often. Care must likewise be taken that there be neither splinters nor turpentine in the side-linings towards the bottom; for which reason the wood used there, and indeed as high as the sheep could reach from the top of the greatest quantity of dung that ought to be in the cote, should not be touched with either axe or plane, but left in it's natural round form, with only the rough bark thoroughly peeled off it, and the wood then left for some time to dry in the sun, in order that all it's resinous parts may be exhaled. Such is the method of the Swedes when they build cotes of this kind.

“ Besides the above-mentioned windows at each end of the cote, intended chiefly to purify the air in it, there should likewise be other common windows at convenient distances in the sides of this building; because, as was before observed, sheep are fond of much light, and never thrive well in dark places.

“ Their fodder should stand in ricks near the cotes, and be kept as free as possible from dust and all other impurities.

“ The

“ The sheep in the cote should be foddered in cribs made for that purpose, as well for the sake of saving, as to prevent the falling of any thing upon their wool; and for this reason these cribs should be placed in the middle of the cote; for if any hay chances to fall upon the sheep, they pull off each others wool in trying to eat it.

“ The cote thus built, however small it be, must be divided into two parts at least, in order to separate the sick sheep, or such as are ready to lamb, from those which are not in either of these cases: but they who would have a perfectly-complete building to house their sheep in, should divide it into several compartments, in proportion to the number and kinds of the sheep, and according to the other circumstances attending them. These compartments may be made of whatever size is thought most proper, provided the sheep have but room enough in them.—Or, which would seem to be an improvement on Mr. Haftfer's plan, the cotes should rather be built separate, because then, besides the more effectual parting of them in case of need, each kind of sheep will naturally go to the home where they are fed.

“ Besides the above-mentioned compartments, it is necessary to have a moveable crib, about four feet high, going upon four wheels of seven or eight inches diameter each, to be drawn from one place to another. The use of it is to bring the sheep close up together in a small compals, when one would either make them sweat, or count them over. By this means their rubbing one against another, by which they lose a great deal of wool, is avoided.

“ It is likewise necessary to have a small building separate from the common cote or cotes, to

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keep apart such sheep as are attacked with contagious diseases, in order that their breath may not infect the others.

“ As to the colour of the sheep-cote, some would have it to be white, or of the colour of the wood it is built of, in order that the sheep big with young may not see in it any thing to surprize them.

“ The best covering, or roof, is that which is made of straw or holly. The roofs made of boards are apt to warp, and let in the air through their crevices.

“ Great care must be taken to preserve the cote free from spiders and their webs.

“ The outside should be smooth, and free from every kind of glutinous substance, at least as high as the sheep can reach, lest they should rub themselves against it, and thereby tear off their wool.

“ There should be gutters all along the lower part of the roof to receive and carry off rain.

“ As soon as the cote is finished, it should be fumigated in the inside, by burning in it hoofs or horns of cattle rasped, the hair of cattle, woollen-rags, brimstone, and boughs of juniper with their fruit on.”

Mr. Hastfer's above directions appear to be chiefly calculated for a woody country: but where stones are plentiful, the walls will be best built with them, and tiles or slates will make proper covering for the cotes.

A certain fixed time of the year cannot be observed in all countries for shearing of sheep, because the summer does not advance equally in each of them. The best way therefore is to be directed by the weather, so that the sheep may
neither

neither suffer by the cold when stripped of their wool, nor be injured through too great heat by being made to wear it too long. After they are shorn, they should be anointed with something that will destroy any remaining vermin. Columella (*f*) recommends for this purpose a strong decoction of lupins, lees of wine, and the dregs of oil, of each equal quantities, mixed together. Some use a decoction of tobacco in salt water. After the skin has been soaked with one or other of these liquors for three days, the sheep should be washed in the sea, if near; otherwise, in water in which salt has been boiled.

The wethers have generally more wool than the ewes, and it is also better. That of the neck and the top of the back is the prime; that of the thighs, tail, belly, throat, and head, is not so good; and the worst is that which is taken from dead beasts, or such as are sick. White wool is also preferred to the grey, brown, and black, because it will take any dye. Strait wool is better than curled; and it is even said that the sheep whose wool is too much curled are not in so good a state of health as those whose wool is straighter.

The general colour of sheep is a dirty white, or pale yellow; there are also many of a blackish brown, and not a few spotted with a yellowish white and black.

The flock should be examined every year, in order to pick out such as begin to grow old, and are intended for fattening; for as these require a different management from the others, they should then be formed into a separate flock. They should be led abroad in summer before

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the rising of the sun, that they may feed on the grass whilst it is yet moistened with dew; for nothing forwards the fattening of wethers more than a great quantity of moisture: and as, on the other hand, nothing obstructs it more than too much heat, they should be brought home, or at least driven to a shady place, at about eight or nine in the morning, before the sun begins to be too powerful, and salt should then be given them to excite thirst. About four in the afternoon, they should be led a second time into cool and moist places, and be again made to drink as much water as they can before they are either housed or folded at night. Two or three months of this management will give them all the appearance of being full of flesh: indeed they will be fattened as much as they can be: but as this fat proceeds only from the great quantity of water which they drink, it may properly be looked upon as no better than an oedema, or bloated humour, which would in a short time turn to the rot; the only means of preventing which is to kill them whilst in this state of fatness: though even then their flesh, far from being firm and juicy, is extremely insipid and flabby. To render their flesh perfectly fine and good, they should, besides feeding on the dew and drinking a great quantity of water, have at the same time more solid food than grass. To this end the shepherd should also, in the season, turn them into the fields, to glean, as soon as the corn has been taken off. They may be fattened in any season, even the winter not excepted, by only keeping them apart in a sheep-cote, and feeding them with good hay, meal or barley, oats, wheat, beans, &c. mixed with salt, to make them drink the more copiously. But in
 whatever

whatever manner, and in whatever season they are fattened, they must be disposed of immediately; for they cannot be fattened twice, and if they are not killed by the butcher, they will die by diseases of the liver. Three months are at all times sufficient to fatten them; but less will do near the sea.

Ewes fatten very fast near their pregnancy, because they then eat more than at other times: but their flesh, and especially that of an old ewe, is flabby and insipid. That of the ram, though he has been knitted before fattening, is always rank and ill-flavoured. The flesh of the weather is by far the most succulent, and the best of all common meats.

The proper time for castration is when the lambs are five or six months old, and the weather mild. The best way of performing this operation is by incision. The testicles, which are easily separated from the bag, are then drawn out at the wound, and cut off. The lamb will probably be sick and dull for a little while after the castration, and therefore it will not be improper to give him for two or three days a small quantity of salt, to prevent a loss of appetite, which this operation often occasions.

The antients tell us, that all ruminating animals have suet; but this is strictly true only of the goat and sheep, and that of the sheep is in greater quantity, whiter, drier, firmer, and of a better quality than the other. Fat differs from suet, in that it continues always soft; whereas suet hardens as it grows cold. It is chiefly about the kidneys that the suet is found; and, as was before observed of the horned cattle, the left has always more of it than the right. There is also a great deal of it in the cawl, and about the intestines;

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testines; but this suet is far less firm and good than that of the kidneys, the tail, and other parts of the body. Wethers have no other fat than suet; and so predominant is this fat in their constitution, that all the extremities of their flesh are covered with it. Their very blood is not without it; and the seminal lymph is so saturated with it, as to appear of a different consistence from that of other animals.

C H A P.

C H A P. III.

Of the Propagation of Sheep.

THE ram is capable of generating at eighteen months, and a ewe may yearn at the end of a year : but it is better to stay till the ewe be two, and the ram three years old ; for the produce of these, if too early, or even the first at any time, is always weak, and of a bad constitution. One good ram will suffice for twenty-five or thirty ewes.

The qualities required in a good ram are, that he be strong and comely : his head must be large and thick ; his forehead broad, round, and well rising ; his eyes large and black ; his nose short ; his neck thick, and arched like that of a fine horse ; his body long and raised ; his shoulders, back, and rump broad ; his testicles large, and his tail long ; his legs small, short, and nimble ; he must also have horns ; for those which have not any, as is the case of some, are very indifferent creatures for breeding, at least in climates like our's. The best rams are white, with a large quantity of wool on the belly, tail, head and ears, quite down to the eyes ; and particular care should be taken that neither the mouth nor tongue be either black or speckled, because the wool of the lambs would most probably partake of this defect.

The best ewes for propagation are those which have most wool, and that close, long, silky,
and

and white; especially if they have also a large body, a thick neck, and an easy, light gait.

The natural season of the ewe's heat is from the beginning of November to the end of April; but they may be brought to conceive in any season, by giving them provocative foods, such as bread made of hemp-feed, or oatmeal, oil cakes, &c. and water in which salt has been diluted. Each ewe should be covered three or four times, and then separated from the ram, which always prefers the older sheep, and neglects the younger. In the season of copulation, they should not be exposed to rain or bad weather; wet hindering their retention, and a clap of thunder often producing abortion. In a day or two after they have been covered, they should be returned to their common diet, and not have any more salt-water; because the continual use of this, as well as that of hemp-feed bread, or other hot aliments, would infallibly cause abortion: but they may always be given to the ram for some time before he is put to the ewe. Ewes go five months, and yearn at the beginning of the sixth. They seldom bring more than one lamb at a time. In hot climates they yearn twice a year, but in colder countries only once. Those which are rather lean than fat, bring forth most easily.

Some put the ram to their ewes about the end of July, or the beginning of August, in order to have lambs at Christmas, or early in January: but then they run a hazard of the lambs being destroyed by the cold, for they are extremely tender creatures. However, the ram is given to the much greater number in the months of September, October, and November; and lambs are accordingly to be had in plenty in February, March, and April. They are also to be had in

May, June, July, August, and September; there being no scarcity of them but in October, November, and December.

When a ewe is near yeaning, she must be separated from the flock, and carefully watched, in order to her being assisted, if needful; for the lamb often presents itself cross-wise, or with it's feet foremost, and in either of these cases the ewe's life would be in danger if she were not helped. As soon as the lamb is yeaned, it must be raised on it's feet, and at the same time all the milk in the ewe's udder should be drawn out, because it is vitiated, and would be very noxious to the lamb, which must therefore be kept from sucking till the udder is replenished with fresh milk. The lamb must be kept warm, and should be shut up with it's dam for three or four days, that it may learn to know her. During this time, the ewe should be fed with good hay, barley-meal, or bran mixed with a little salt; and her drink should be water, the chill of which has been taken off, mixed with a little flour, bean-meal, or ground millet. At the end of four or five days she may be gradually brought back to the same kind of food as the other sheep, and be returned to the flock; only taking care that she be not driven too fast, nor too far, lest her milk should be heated: and some time after, when the sucking lamb shall have gathered strength, and begins to play, it may be left to follow it's dam to the pastures; no farther care being then necessary; for it will find it's dam amidst a very numerous flock, and seize her dug, without ever being mistaken.

Lambs yeaned between the beginning of October and end of February must be kept in the house, on account of the cold, and be suffered to

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go out only in the morning and evening to suck; but in the beginning of April they may be turned into the open fields. Some time before this is done, a little grass should be given them daily, in order to accustom them by degrees to this new food. They may be weaned at the end of one month; but it is better to let them continue to suck for six weeks or two months.

The largest, most vigorous, and thickest-fleeced lambs, especially if their wool be all white and without spots, are the best for keeping. Those of a weakly appearance are generally disposed of to the butcher. Lambs of the first yeaning, as was before observed, are never so good as those of the following: and it is a general rule with all good husbandmen, rather to bring up the young of their cattle of every kind, than to sell them off when young; the profits in the former case being by much the most considerable.

The ewe yields, during seven or eight months, plenty of milk, which is good food for children and peasants. It also makes good cheese, especially if mixed with that of cows. Ewes may be milked twice a day in summer, but only once in winter, viz. immediately on their going to pasture, or at their return.

Ewes eat more during their pregnancy than at other times, and accordingly they then fatten very fast: but they are also then very apt to hurt themselves, so as, frequently, to miscarry, and sometimes to become barren from that time: nor is it very extraordinary for them to bring forth monstrous productions. If no accident befalls them, and they are properly tended, they are capable of yeaning during their whole life; that is, to the age of ten or twelve years: but
generally

generally they break and become sickly when they are turned of seven or eight. A ram lives to twelve or fourteen years; but is no longer fit for propagation after eight: he should therefore then be knit, and fattened with the old sheep; though even then his flesh will be rank and ill-tasted: that of an old ewe is at best flabby and insipid: the flesh of the wether is most succulent, and the wholesomest of all common meats.

C H A P. IV.

Of the Diseases of Sheep.

A Shepherd well versed in feeding his flock properly during the different seasons of the year, and skilled in the methods of curing the several disorders to which sheep are subject, is a very valuable person, and therefore should be sought for with the utmost diligence; for on his care and abilities the welfare of the flock greatly depends. How injudiciously then do they act, who resign the care of their sheep to boys, or to the least deserving of their servants!

Mr. F. W. Haflfer, the Swedish gentleman before quoted, and to whom the world in general, and his own country in particular, is much indebted for a well-methodized set of *Instructions concerning the manner of rearing and improving sheep*, reduces the general causes of their diseases to the five following heads, viz. 1. Too great heat; 2. Severe cold; 3. Water; 4. Fright; and 5. Unhealthy pasture.—If due care is taken to prevent the inconveniencies which arise from these causes, there will not be much room to fear a general sickness or mortality amongst men.

It is generally thought that the brain of a sheep is more affected by heat than that of any other creature: hence the inconveniencies which arise to them from the burning heat of the summer; and as their wool forms a warm covering around them, the least additional heat greatly increases that which they have naturally. Even

in the winter, sheep, particularly in foreign countries, often suffer from the too-great heat of their cotes, which their shepherds shut up very close, and can scarcely be persuaded that they are doing them an injury. In this very wrong practice, which prevails in the northern parts of Europe, and even in France, the heat becomes prejudicial on a double account; first, from the heat itself, which, in crowded cotes, sometimes rises to the dog-day heat; but chiefly by the perspiration of the sheep, which not only makes the air less fit for breathing, but by degrees renders it so putrid as to give rise to fevers of the worst kind.

Though sheep can bear cold much better than heat, yet they should not on any account be exposed to a too-severe degree of it; and above all, particular care should be taken that the pregnant ewes do not drop their lambs in the open air when the weather is very frosty, because that might cripple the lamb for life.

Too rainy a season is very prejudicial to sheep, as was remarkably experienced all over England in the summer of 1766, when whole flocks perished with the rot. They who had luckily sown burnet before, were then made thoroughly sensible of it's good effect, not only in preventing this fatal disease, but also in curing sheep that were then in almost a dying condition. Parsley would have the same effect, as it is probable that both of these plants carry off the too great humidity by urine. Where neither of them can be had, the sheep should be housed during violent falls of rain, be fed with dry hay, and, as much as possible, sheltered from the wet.

Mr. Haistfer (a) recommends the following powders as efficacious preservatives in such sea-

(a) *Part II. p. 139, 141.*

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sons. He calls the first of them *ant-powders*, and the two others *drying-powders*. The ant-powder is made thus :

“ In autumn, when the ants have done working, take the whole of an ant-hill, ants and all, scooping it out quite to the bottom, in order to have the more of the mastic or resinous substance which they provide for winter. Dry it well in an oven, till the ants and earth can easily be crumbled into dust betwixt one's fingers; then pound and sift it very fine, and keep it in a vessel that has been used for salted meat or pickled herrings; first drying the vessel well before the powder is put into it.—Give to each sheep a quarter of a pint of this powder mixed with twice as much oats, in their cribs, or otherwise, after having sprinkled it with pounded salt, very salt water, or human urine. It will make the sheep sweat, and experience will prove it's good effect.”

Mr. Hastfer adds, that this ant-powder is much used in Germany, as the writings of Colerus, Bayer, and others testify; that he has seen it given in some places in Sweden, though not many; and that he himself has used it on several different occasions, and found that nature frequently affords in simple remedies as much real utility as in the most costly. In the year 1746, which was a very wet year in Sweeden, he gave this powder, by way of trial, to four sheep, once a week, and when they were killed the next autumn, their gall and liver were perfectly sound, whilst other sheep, which had not taken it, were full of gall, and their livers covered with hydatides, or watery tumours, in great numbers and of all sizes.

Of his *drying powders*, as he terms them, one is composed of two ounces of crude antimony,
four

four ounces of bay-berries, four ounces of sulphur, two ounces of nitre, pounded together, and mixed with ten pounds of salt. This is then to be put into the cribs for the sheep to lick of it, and into their drink, especially in autumn after they are housed, and after a rainy summer, when there is room to fear they may have suffered by the wet.

The other of these powders is made thus: Take a pound of crude antimony, half a pound of nitre, and a quarter of a pound of red tartar; pound them well separately, and mix them together. A good spoonful is enough for six or eight sheep. Mix it with a little meal and dry wormwood, make it into a paste, and give the bigness of a walnut of it once or twice a week to each sheep, in autumn and spring, when a general mortality prevails. This case excepted, it is used only as a preservative once in three weeks or a month; and then not till after the ewes have lambed, and the lambs are somewhat biggish. The sheep must not be suffered to drink the same day that they have taken this remedy; but, on the contrary, they should be driven about a little backwards and forwards. This powder purges them by urine and sweat, drives out their too-abundant humours, and is a very salutary medicine.

The same ingenious writer gives us also, from Van Aken's *Pharmacopæia* for sheep, the following recipe for making the *Pomeranian powder*, famed for it's efficacy in curing many disorders in sheep.

“ Take a pound of the grey powder of compound salt-petre; of gentian and bay-berries each four ounces; juniper-berries, common salt, roots of angelica, elder, pimperlle, aristotolochia, monks-hood, cyclamen, black hellebore, root of

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fern, betony, millepersius, carduus benedictus, rhue, millefoil, fumetory, and hysop, an ounce and a quarter of each, with two ounces of tops of wormwood, two drams and an half of assa-fætida, and six balls of castor prepared. Pound all this into a gross coarse powder, and give to each sheep half an ounce of it two or three times a week in the morning, mixing it with paste, or making it up into pellets. They are very fond of it. When contagious distempers prevail amongst sheep, and there runs from their mouths a thick and glutinous slaver, it is a good sign; but people who have large flocks, as the shepherds of Pomerania, who have sometimes five or six thousand sheep to take care of, may give this powder to a dozen or more sheep at a time in water, a little thickened with flour; taking care that each sheep has, as nearly as possible, it's portion of half an ounce of it. When this powder is given them they must not have drank water for two days before.

After they have taken this remedy they should be driven about a little, and not suffered to drink till the next day, when juniper and wormwood should be put into the water that is given them. If they are dropfical, they should not be let drink oftener than every third day. There are extraordinary proofs of the excellent effect of this powder in cases where other celebrated remedies have not done any service; and experience will convince those who use it properly; for it not only expels the noxious humours, and dries gently the scab and small-pox, but likewise eases the breast, so that the sheep that it has been given to twice a week have recovered their heath, and in a fortnight after, the dropsey being come on, and their heads swelled again as big as ever, they have been perfectly restored by the

the use of this powder given two days together. Care must therefore be taken to use this powder in time, in case of a relapse.

A little salt should be sprinkled over almost all the medicines that are given to sheep: it will make them relish what might otherwise be loathsome; and so far as can conveniently be, they should be physicked when the weather is fine: however, this must necessarily admit of many exceptions."

Pestilential diseases will be so fully treated of in the latter part of this volume, that I shall only mention here Mr. Haistfer's having experienced the efficacy of the above *powder of antimony*, in preserving sheep from pestilential infections, even when those which had taken it chanced to be mixed with sheep that were infected. He likewise recommends the use of rhue in their food, and suspended round the neck, when there is a fear of such disorders; and also to prevent their being bitten by snakes, these reptiles having an aversion to that plant.

S E C T. I.

Of cutaneous Diseases in Sheep.

THE *Scab*, or *Itch*, in sheep is contagious, and therefore carefully to be guarded against. It arises from various causes, such as unkindly seasons, the skin's being wounded in shearing, or torn by thorns, brambles, &c. Lice also, by breaking the skin in quest of food, or perhaps for nests to lay their young ones in, bring on the itch, as does also the sheep's being reduced by hunger.

As soon therefore as the sheep are observed to scratch or rub themselves against any thing, or

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to bite their skin, the shepherd should examine their skin with great attention, to see whether they have not the itch. If they have it, the wool must be cut off wherever that disorder is perceived, in order that the part may be the more conveniently rubbed with ointment, in which there is brimstone; for that seems to be the certain antidote, though many forms are boasted of, in almost all of which sulphur is an ingredient. Quick-silver is sometimes added, on a supposition of it's being more efficacious to destroy the lice. The small lice, commonly called ticks, which are little hairy worms shaped like buggs, and which pierce the skin, as easily destroyed by a strong decoction of tobacco-stalks poured all along the back of the sheep, so as to run down on both sides: some add brandy, to render it the more penetrating. Others again put half a pound of tobacco and a handful of salt into five or six quarts of water, boil it well, and after the sheep is shorn rub it in with a brush, not over-hard. At the same time they may likewise take the antimony powder as an alterative, or the æthiops mineral, if the disorder is come to a great height.

The writers of the *Maison Rustique* recommend strongly the following, as an excellent general remedy for all sorts of animals, sheep, goats, dogs, cows, horses, &c. "Take an ounce of liver of antimony, wrap it up in linnen, then put it to steep in a quart of wine, (white wine is best) and mix therewith eight drams of fenna: you may, if you please, add sugar, nutmeg, and other warm spices; for almost all the diseases of grazing animals proceed from cold and damp. The remedy is not the less good for not having any spice. It has been tried every way. Let the drugs steep twenty-four-hours, or
boil

boil them with the wine for six or eight minutes, and give a gill of it to each sheep, the same dose to other small animals, and to large ones, such as cows and horses, a quart. The creature must be kept in a warm place all the day, be well covered, and not have any thing to eat till the evening. He will purge both upwards and downwards. The scab and itch will, by this means, be driven out, and the cure will be completed by bathing the sores with the wine in which the liver of antimony has been steeped, after setting fire to it. No itch will resist this remedy."

Whatever composition is made use of, it should be rubbed upon the parts affected for at least three or four successive nights; and when the scabs begin to heal and peel off, the sheep should be washed in a river, if in summer, or in a tub of water made a little warm in winter, and be kept within doors till the wool is quite dry. Special care must be taken that the sheep must be perfectly cured before they join the flock.

Another cutaneous disorder (*a*), to which sheep are liable, sometimes attacks the face in particular, in such manner that the skin and flesh fall off, the eyes drop out, the ears and horns fall off, and the skull is left bare. Sometimes too it spreads itself over half the body before the sheep dies. This is thought to be incurable, but not contagious. The following application has here been attended with the greatest success. Take oil of tobacco and sulphur, with quenched mercury, mix, and rub the the fore with them, and wash it once a day with a very strong decoction of rhue boiled in water. A peasant, who had a sheep so ill of this disorder, that it's

(*a*) *Hæstler*, P. II. p. 179. calls it an *Erysipelas*, or *St. Anthony's fire*.

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head was eaten all around, freed it from the distemper in five weeks, by treating it as above. Mr. Hastfer (b), who relates this case, adds, indeed, the creature's eyes fell out of it's head, and that it's wool became so entangled and confused as to be all over full of knots.

S E C T. II.

Of Diseases of the Head and Throat.

WHEN sheep are exposed to a great heat of the sun, they are frequently seen to become giddy, and turn round. Too much heat of any kind, feeding too long on a dry pasture without drink, or other such causes, may have the same effect. This is remedied by bleeding, either in the jugular, or in the vein under the eye, or by cutting off the tip of the ear, and by keeping them in a cool place, with plenty of cooling drink, till the symptoms quite disappear. But if the complaint arises from water contained in the head, as is sometimes the case, it is incurable; and therefore, when it does not readily yield to easy remedies, the best way is to kill the sheep before the disorder has reduced it.

Sheep are also frequently seized with an apoplexy, in which they fall dead at once. If signs of life remain after they are fallen down, such things as will hereafter be pointed out as antidotes against poison may be given, and blood be drawn from every place that will afford any. Some are very fond of cutting off the end of the tail, and leaving it to bleed as long as it will.

(b) *Part II. p. 180.*

Sheep are liable to tumours in the throat, which should, if possible, be brought to suppurate, lest the matter be translated to some other part. When suppurated, the swelling should be opened, and a free discharge given to the matter: but some caution should be used at first in the opening, to avoid a worm that is sometimes found in such tumours, which being of a poisonous nature, would, if cut, envenom the sore, and endanger the life of the animal. After the worm has been extracted, the abscess is to be cured as before directed for horses.

S E C T. III.

Of Coughs and Shortness of Breath.

THE diseases of the breast, such as cough and difficulty of breathing, are to be treated nearly in the same manner as before directed for horses (a). In case of a fever, which is known by the frequency of breathing, heat, dry mouth and tongue, disrelish of food, &c. blood should be taken from the neck, and repeated occasionally. Frequent bleeding becomes therefore necessary in sheep, because it is seldom that much blood can be got at a time. In other respects, they are to be treated as before directed for horses in similar cases, and the discharge from the nose should be encouraged, as is likewise there advised (b).

When a cough arises to such a degree as to occasion a discharge from the nose, it is advisable to separate the sick from the sound, because there is reason to fear that, in this state, the cough

(a) See *Señ. II.* p. 100.(b) See *Señ. III.*

may be contagious. Mr. Haſtfer ſays (c), that knot-graſs is ſo very prejudicial to ſheep, as to occaſion violent coughs, in which they dart forth a thin ſtinking matter.

S E C T. IV.

Of Diſeaſes of the Belly.

DIſEASES of the belly may alſo be cured in the manner before directed for horſes, only altering the quantities of the doſes in proportion to the ſtrength of the ſheep. Their having the colic, or any other diſorder in their bowels, may be diſcovered by their directing their head to their belly, and being otherwiſe diſordered,

S E C T. V.

Of Diſeaſes of the Liver.

THE livers of ſheep are ſubject to ſeveral diſorders. In the rot, the liver is conſtantly diſtempered: hydatides, or ſmall watery tumours, are often found in it, and frequently worms; concerning which laſt M. de Buffon (a) gives us the following curious extract of a Letter written by a doctor of phyſic at Montiers, in the duchy of Tarantaſe in Savoy, communicated to him by M. Rouillé, ſecretary of ſtate in France for foreign affairs. “It has for a long time “been obſerved, that the ſheep of our Alps,

(c) *Part I. p. 105.*

(a) *Hiſtoire Naturelle de la Brébis.*

“ which

" which are the best in all Europe, sometimes
 " fall away surprizingly. Their eyes become
 " white, sunk, and bleared; their blood serous,
 " with scarce any redness to be seen in it;
 " their tongue dry and shrivelled; their nose
 " stuffed with a yellow viscid and putrid mucus;
 " an extreme debility, though they eat a great
 " deal; and, in fine, the whole animal system
 " visibly decaying. After several close inquiries,
 " these animals were found to have in their liver
 " white *papillons* (moths), with proper wings,
 " their heads of a semi-oval form, and of the
 " brightness of those belonging to the silk-
 " worm. I have been convinced of the reality
 " of this fact, by squeezing about seventy out
 " of the two lobes; and, at the same time, all
 " the convex part of the liver became lacerated.
 " They have been found in the veins only,
 " without a single instance of their being in the
 " arteries. In the cystic duct, small ones have
 " have been found, together with maggots.
 " The vena porta, and the capsula of Douglass,
 " which are visible there as in man, yielded to
 " the softest touch. The lungs and other viscera
 " were sound."—Here M. de Buffon very justly
 remarks, that it were to be wished the doctor had
 given us a more circumstantial description of
 these *papillons*, as he calls them, lest it should be
 doubted that the animals which he saw were in
 truth no other than the common worms found
 in the liver of a sheep, which are indeed very
 flat and broad, and of so singular a figure, that
 they might rather be taken for leaves than
 worms.

The chief reliance for a cure of this disease
 should, I think, be in antimony and mercurials;
 perhaps of choice in the æthiops mineral. Mr.
 Haister

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Hastfer recommends here rhue mixed with antimony.

Christopher Baldwin, Esq; of Clapham, in Surry, has found burnet to be remarkably efficacious for the cure of the rot, as appears from a letter of his, published in a well-intended and very useful work, called *The Repository for select Papers on Agriculture, Arts, and Manufactures*, begun in 1768, but unfortunately dropt at the end of only a second volume; and a farmer in the north, in the autumn of the year 1766, when all his sheep were so far gone in the rot that he did not expect one of them to live the winter over, sent them into a field of burnet, which, in a month's time, restored them to perfect health.

The Memoirs of the Royal Society of Agriculture at Rouen inform us (b), that one of their members had recommended parsley as a good remedy for several of the diseases to which sheep are subject, such as pimples, the small-pox, running at the nose, the itch, &c. and that it had been found to answer, when tried by a dealer in sheep, whom they name. The way of using it is, to turn the diseased sheep fasting into a field of parsley, and leave them there for a quarter of an hour a day during eight days. The parsley will grow again, so as to yield seed, or may be cut and dried for sheep that are ill in the winter.

When sheep have swallowed any live creature, such as spiders, caterpillars, leeches, &c. the best way of treating them is as before directed for horses in a similar case.

(b) Page 28.

S E C T.

S E C T. VI.

Of the Dropsy.

SHEEP are subject to a watery swelling, which frequently affects the whole body; and is at first discovered by the head's becoming larger, particularly under the lower-jaw, where the water is collected into a kind of bag, and by the body's being swelled.

The cure should begin with antimonial purges, keeping the sheep at the same time on dry food. — A full pint of strong decoction of the lesser species of sedum (*sedum minus*) given to a sheep as soon as this disease is perceived, is said to be an excellent remedy in cases of this kind. It purges strongly.

Likewise the following is recommended by Mr. Haistfer (a), as very efficacious, for sheep that have the dropsy. — After purging them, which should always be the first thing done in this disease, take of dried wormwood, either powdered or chopt small, of parsley picked clean and shred small, of bark of elder pounded or ground, a quart of each; also a gallon of strong sea-salt well pounded, and a full quart of oat-meal, or as much as may be wanted to make the whole into a paste. Put all these ingredients into a kneading-trough, mix them well together, and knead them into a paste with good river-water. Make this paste into pellets about the bigness of a walnut, and give to each sheep fasting two or three of them, according to its size and age. The sheep must remain housed for three or four hours after they have taken this remedy, and then they may

(a) *Part II. p. 213.*

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be walked out, if the weather is fair and dry, but with great care to keep them from water all that day. If the weather be bad, the best way is to feed them that day and the following night in their cote, with straw or other dry food.

The way to make them take this remedy, at least till they become accustomed to it, is, to thrust the pellets down their throat with one's fingers: but they will soon eat them of their own accord, if they are only laid in the crib.

These balls are used every year in the sheep-cotes of Hojentorp and Berga, in Sweden, and have been found to be a certain cure for the dropsy in sheep. The above-mentioned quantity of ingredients will make from 170 to 180 balls, which are sufficient for sixty old sheep, or eighty or ninety young ones, or lambs.

In case the necessary ingredients cannot be had in the country, take for ten or twelve sheep the value of five or six quarts of oatmeal, and dry it well in an oven, or over the fire, in a pot or pan, then mix with it salt and bay-berries dried and pounded, of each a good pint, half a pint of powdered wormwood, an ounce of laurel-berries pounded, and a pint of nettles with their seed dried and pounded. All this being well mixed together, it may be given to the sheep in a trough or crib made on purpose for that end, or it may be divided into portions of a pint for each sheep, and given in the morning fasting, with care not to let them eat any thing else till two or three hours after, at the end of which they may have hay or dry straw; but they should not be suffered to drink that day. This should be continued twice a week so long as is necessary, and in proportion as the distemper is more or less obstinate. One may likewise, from time to time, offer them wormwood-water to drink.

If

If the sheep refuse to take the medicine thus prepared, let some oats be ground, and a paste made of their meal, with the other ingredients, to which may be added for each sheep three or four drops of oil of foot, and of bark of the birch-tree. Let the same number of balls be made of it as was before said, and given to the sheep in the same manner.

Another remedy is made thus: Take four pounds of rhue, shred it fine, put it into a tub, pour upon it six or eight gallons of boiling water, cover the tub, and let it remain to infuse six hours: then strain the water off through linen, and put in as much sugar as will make an egg swim upon it.

When sheep are dropfical, two spoonfuls of this are given them evening and morning, till they are cured: but as a preservative, only one spoonful is given them, evening and morning, twice a week. Five spoonfuls of it are given, evening and morning, to large cattle, in the same manner as it is given to the small. Also, a mole may be taken, cleaned, and dried, then pounded, and when a sheep or other animal is seized with the hydrophobia, let the bigness of a pea, or of a small bean, be given to it in a spoonful of beer. This remedy has been repeatedly tried, and found successful (*b*).

(*b*) *Haffner, Part II. p. 218.*

B O O K VI.

O F G O A T S.

THE Goat is naturally more sagacious and better able to shift for itself than the sheep: it comes readily to man, soon grows familiar, is sensible to caresses, and capable of attachment; it is also stronger, and less timorous than the sheep. It is quick in it's motions, capricious, more lively, nimble, obstinate, and so fond of roving, that the strongest and most active man cannot drive above fifty goats at a time; consequently it is difficult to keep them in herds. They are fond of straying in solitary places, of climbing up craggy mountains, of standing and even sleeping on the summits of rocks and the brinks of precipices. The most scorching rays of the sun never incommode them; they are not frightened by storms, and they bear rain quietly, but they seem to be affected by great cold. There is scarcely a spot so barren as not to afford them sufficient sustenance, for they will browse even upon thorny shrubs; and very few sorts of herbs disagree with them, even hemlock not excepted, which is poison to other animals.

Goats are naturally so fond of man, that they never become wild near inhabited places. As a
proof

proof of this; in the year 1698, an English ship having put in at the island of Bona Vista, two Negroes came on board, and after some intercourse told the English that they should be welcome to as many he-goats as they pleased. The captain expressing some surprize at this offer, the negroes answered, that they were only twelve persons on the whole island, and that the goats had increased so prodigiously as to be even troublesome; and that they were so far from being difficult to catch, that they would follow a man like tame animals.

The most usual colours of goats are white and black; some are entirely white, and others wholly black; but generally white and black, and often with a mixture of brown and fallow. The hair is of an unequal length on different parts of the body; every where stronger than that of horses, but less harsh than that of the horse's mane; and there have been instances of it's being intermixed with tufts of a whitish wool, as long as the hair, on the back and upper parts of the sides. The beard of a he-goat, which M. de Buffon measured, was nine inches long, and it's mane, towards the withers, was six inches in length. On the rest of the body, the hair was in general about three inches long, but somewhat more on the pasterns and coronet.

The male goat is capable of engendering at a year old, and the female at seven months; but the kids of this forward commerce are weak and defective; for which reason they are generally both restrained from copulation till eighteen months, or two years. The he-goat, besides being no despicable animal, is so very vigorous and fallacious, that one will be sufficient for above an hundred and fifty she-goats, during two or three months; but this ardour consumes him,

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him, and never lasts above three or four years; so that he becomes enervated, and even old, before he has reached his sixth or seventh year.

Such is the disposition of the she-goat, that the fickleness of her temper is plainly seen from the irregularity of her actions. She walks, stops, runs, skips, leaps, draws near, flies off, appears in sight, hides herself, or flies away, as by caprice, and without any other determining cause than the unaccountable vivacity of her internal sentiments; and all the suppleness of her limbs, and vigour of her body, can hardly answer the wantonness and rapidity of these motions, which are purely natural.

For propagation, the he-goat should be young, and of a good figure; that is, about two years old, and of a large size; his neck short and fleshy, his head slender, his ears long and lapping, his thighs large, his legs firm, his hair black, thick, and soft, and his beard long and bushy. The she-goat should have a large body, full rump, large thighs, light head, capacious udder, long teats, and soft and thick hair. Their usual season of heat is during the months of September, October, and November; but at any other time, if they happen to be near the male, they are soon disposed to admit him; for they can copulate and yeau at any time of the year. They, however, retain best in autumn; and the months of October and November are preferred, in order that the young kids may find a soft succulent herbage when they first begin to feed: for the she-goat goes five months, yeans at the beginning of the sixth, and suckles her kids about a month or five weeks. Generally, indeed, she brings only one kid; though sometimes she has two, very seldom three, but never above four. These creatures sometimes suffer greatly in yeaning; and therefore

therefore they should be watched, in order to be assisted in case of need.

Goats are turned out to feed very early in the morning, before the dew is off the grass; because this, though pernicious to sheep, is extremely palatable, and even wholesome, to these animals. In snowy and wet weather, they are kept under cover, and fed with herbage, small boughs of trees gathered in autumn, cabbages, turnips, and the like. Plentiful feeding increases their milk; and to keep up, or still augment it's quantity, they should be made frequently to drink water mixed with nitre and salt. They may be milked in a fortnight after yearning, and during four or five months they yield plenty of milk morning and evening.

When goats are driven with sheep, as sometimes happens, they always take the lead of the flock: but it is better to feed them separately on high grounds, hills, mountains, and such like places, in which they take most delight. Heaths, fallows, commons, and barren grounds will afford them as much food as they want: but they must never be suffered to feed in cultivated lands, corn-fields, vineyards, or woods, because they would browse greedily on the young shoots, or the bark of the trees, and thereby do great damage.

The he-goat readily copulates with the ewe, as the afs does with the mare; and the ram joins himself with the she-goat, as the stallion does with the she-afs. But, though these copulations are sufficiently frequent, and sometimes prolific, no intermediate species has been formed between the goat and the sheep: they are absolutely distinct, continue always separated, and always at the same distance, without having been the least altered by such mixtures.

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Goats cannot endure damp places, marshes, or rich pastures: few of them are bred in flat and open countries, because they generally are sickly there, and their flesh is of a bad quality: but in most hot climates they are bred in great abundance, without any shelter over them; whereas in colder regions, the winters would kill them if they were not housed. In summer they do well without litter, but in winter they require it; and as all wet is very hurtful to them, they should not be suffered to lie in their dung, but have fresh litter as often as needful.

The she goat is prolific to the age of seven years, and the he-goat might certainly retain his generative faculty to that, or even a greater age, if he was suffered to be with the females only at proper times: but he seldom serves longer than five years, which bring him to about the same age: he is then castrated, and sent to fatten with old she-goats, and young he-goats castrated at six months, for that is the usual time, in order to render their flesh more tender and juicy. They are fattened in the same manner as sheep: but neither care nor aliment, of any kind whatever, can possibly render their flesh equal to that of the sheep, unless, perhaps, it be in hot climates, where mutton is always flabby and ill-tasted. However, the strong smell of the he-goat does not proceed from his flesh, but from his skin; and the older he is, the ranker that will be.

M. de Buffon says, (a) that these animals might live to the age of ten or twelve years if they were not killed when fattened after being past engendering; and I cannot but be of the opinion of that very judicious and experienced Naturalist; consequently, the Chaplain to the Centurion's

(a) *Histoire Naturelle de la Chèvre.*

telling us, in his account of Lord Anson's voyage, that they found upon the island of Juan Fernandez a he-goat, which, from the slits in his ears, appeared to have been formerly under the power of one Selkirk, who lived several years on that island, and had quitted it above two and thirty years before their arrival, appears to me, supposing it to be literally true, nothing more than one of those exceptions to a general rule, which M. de Buffon himself apprizes us will sometimes happen.

The age of a goat may be known by it's teeth, and by the knots in it's horns, when it has any: for though both he and she-goats generally have horns, there are many exceptions to the contrary; and as to their teeth, they have not any of the incisory ones in their upper jaw, but those of the under jaw are shed and recruited at the same times, and in the same order, as those of sheep. In the she-goats, indeed, the number of teeth is not always the same, but usually less than in he-goats, whose hair is also harsher, and their beards and horns longer. Like the ox and sheep, they have four stomachs, and chew the cud. They also differ greatly in the colour of their coats. Those that are white and without horns are said to yield the most milk, but the black are the strongest and most robust.

These creatures cost little or nothing to bring up, as we have seen, and their value is by no means inconsiderable, if properly attended to; for their flesh will always fetch something, and their suet, hair, and skin, sell at a good price, especially the skins of kids, of which the finest gloves are made. The skin of the goat is preferred to that of the sheep, and the flesh of the kid is nearly equal to that of the lamb. They are less affected with the diseases of any climate

than sheep are, and stand less in need of the assistance of man. Goat's milk is a part of the *materia medica*, frequently prescribed in cases of decay, and wholesomer than that of the ewe: it curdles easily, and makes excellent cheese; but as it contains only a small proportion of butyrous particles, the cream should not be separated from it.

She-goats seem pleased with being sucked, as they often are by children, to whom their milk is an excellent aliment. Like cows and ewes, they are apt to be sucked by snakes, hedge-hogs, and a bird called the Goat-sucker. They yield a greater quantity of milk than the ewe.

The species of goats extends much farther than that of sheep; several parts of the world affording goats like ours, with this exception only, that in very hot countries they are smaller, and in cold ones larger.

The Angora, or Syria goats, with their long pendulous ears, and spiral horns, are of the same species with ours, engendering and producing even in our climates. The she-goats in particular, of this breed, like most other animals of Syria, have a very long, thick, wiry hair, so fine, that the stuffs made of it are not inferior to our silks, and full as glossy; witness in particular, the beautiful Brussel's camblets.

BOOK VII.

OF SWINE.

CHAP. I.

Of the Character, Properties, and Uses of Swine.

OF all the quadrupeds that we know, or at least, certainly of all those that come under the husbandman's care, the Hog appears to be the foulest, the most brutish, and the most apt to commit waste wherever it goes. The defects of it's figure seem to influence it's dispositions: all it's ways are gross, all it's inclinations are filthy, and all it's sensations concentrate in a furious lust, and so eager a gluttony, that it devours indiscriminately whatever comes in it's way, not excepting, frequently, it's own young immediately after they are born, and too often infants in the cradle; for whenever these creatures meet with any thing fat, moist, or unctuous, they begin with licking, and soon after devour it. They are consequently fond of blood, and bloody flesh, which they will sometimes eat even when putrid, to the great detriment of their health, though they do not, like the wolf, attack other animals on purpose to kill and devour them.

them. So unbounded is their ravenous desire to fill the vast capacity of their stomachs, and so undistinguishing is their taste, that M. de Buffon, (a) declares he has several times seen a whole herd of these creatures, at their return from the fields, stop and gather round a heap of clay newly dug up, all of them licking this earth, though none of the most unctuous, and some of them swallowing a pretty large quantity of it. This demonstrates their gluttony to be of a piece with their brutal nature: nor is their sense of feeling less sluggish than their taste; for, not only the harshness of their hair, the hardness of their skin, and the thickness of their fat, render them little sensible of blows, but even mice have been known to form lodgments in their backs, and to eat their very skin and fat, without their shewing any signs of feeling them. Their other senses are indeed quick and acute enough: though still they seem not to have any one clear sentiment; for the young hardly know their own dam, or at least are very apt to mistake, and readily suck the first sow that will let them. — Fear and necessity probably impart a little more instinct and sentiment to the wild race of hogs; for the young of these are strongly attached to their mother, and she, on her side, shews herself more careful to provide for their wants, than the tame sow does: and as to the very great quickness of sight, hearing, and smell in hogs, especially of the wild breed, it is so well known to the huntsmen who go in quest of these creatures, and particularly of wild boars, that they find it necessary to watch for them in the night, to observe a profound silence, and to keep themselves to the leeward, that the hogs

(a) *Histoire Naturelle du Cochon.*

may not scent the effluvia of their bodies, which affect the organs of smelling in these animals so strongly at a considerable distance, that they immediately betake themselves to flight, as if aware of some impending danger *.

The natural defect in the senses of taste and feeling in swine, is also farther increased by a disease which renders them even absolutely insensible, and which is not perhaps so much owing to the texture of their skin, as to their filthiness, particularly in feeding, and especially to their often eating putrid aliments: for neither the wild hog, which does not eat such ordure, nor delight in mire as the tame one does, but generally subsists on acorns, mast, and roots, and lives in dry places, nor a sucking pig, is subject

* The reader who is not acquainted with the method of hunting the wild boar, may not be displeased at the following addition, from M. de Buffon's Natural History of the Hog. "The wild boar is, most commonly, either hunted openly with dogs, or surprized and killed by moon-light. As he is not remarkably swift of foot, he leaves a very strong scent, and often wounds the dogs dangerously in defending himself. For this reason, and because it spoils their scent, and breaks them to a slow pace, the good hounds used for the stag and roe-buck, (or for the fox,) should not be employed in this hunting. Mastifs, after a little training, will be fit for this purpose: but only the oldest of these animals are to be thus attacked, and they are easily known by their tracks. A wild boar of three years is not easily run down; he paces over a great deal of ground before he stops; whereas an old boar does not run far, but suffers the dogs to come near him, and often stops to keep them at a bay. In the day-time he generally keeps in his soil, which is almost always situated in the thickest part of the wood, and when night approaches he goes out in quest of food. In summer, when the grain is ripe, it is easy to surprize him among the corn and oats, which he is sure to visit every night. As soon as he is killed, the huntsmen cut out his testicles; the smell of which is so strong, that if they were left only five or six hours in the dead body, all the flesh would be infected by it."

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to this disease; from whence it follows, that the way to preserve the common hog from it is, to keep him in a clean sty, and to give him plenty of wholesome food.

With all it's defects, however, this animal is one of the most profitable that an inhabitant of the country can rear; for, besides it's young, which generally are very numerous, and always fetch a good price, it's flesh sells for rather more than that of the ox or sheep, and it's lard for near twice as much as their suet†. Likewise, the flesh of this animal takes salt better than that of any other, and keeps longer in this state. It's blood, all parts of it's bowels, it's feet, and it's tongue, are dressed and eaten. The fat of the intestines and cawl, which is very different from the lard, makes what is called the hog's grease: nor is the skin without it's uses, both saddles and sieves being made of it; and of the bristles are made various kinds of brushes, shoemakers ends, &c. and lapidaries use them in polishing of diamonds. The dung of this animal is accounted a fine manure for fruit-trees.

† The lard of the hog is the suet of other animals,

C H A P. II.

Of Feeding and Fattening of Hogs.

THESE creatures are so very stubborn and untractable, that even an active man cannot well take care of more than fifty of them at a time. In autumn and winter, where it can be done, they are driven to such woods as afford plenty of wild fruits: in summer, they feed best in moist and marshy places, where they find worms and roots; and in spring they range the fallow fields. From the month of March to October, they are turned out twice a day to feed; in the morning from the time that the dew is exhaled till ten o'clock, and from two in the afternoon till the dew begins to return in the evening. In winter, they are driven abroad but once a day, and then only when the weather is fine; because the dew, snow, and rain are hurtful to them. Indeed, such is their aversion to bad weather, that if a sudden storm comes on, or only a heavy shower of rain, away they run, full speed, each endeavouring to be foremost, and all continually crying out, till they reach their sty, or some other place of shelter. The youngest cry most and loudest. This cry is very different from their usual grunting: it is a cry of grief, resembling that which they send forth when they are bound in order to be killed. The boar cries less than the sow; and the wild boar

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boar is seldom heard to cry at all, unless when wounded in fighting with another. The wild sow cries more frequently; and both, when surprized and terrified, snort with such vehemence as to be heard at a considerable distance.

These animals are very fond of worms, and particularly so of some roots, especially those of the wild carrot; and to come at these they turn up the earth with their snouts. The wild boar, whose head is longer and stronger than that of the common hog, delves deeper, and generally continues the furrow in a strait line; whereas the tame hog digs only here and there, and at the same time more slightly: but as a great deal of damage is frequently done by this means, all hogs should be carefully kept from cultivated lands, and suffered only to run in woods and fallows.

The common way of fattening hogs is, to give them plenty of barley, mast, cabbage, and other greens boiled, and a great deal of water mixed with bran. By this means they acquire a thick stratum of seam, and are rendered sufficiently fat, in two months: but this fat is neither very firm nor very white; and the flesh, though good, is flabby. They may also be fattened at still less expence in countries which abound in mast, by driving them into the forests in autumn, when the acorns, wild chesnuts, and beech-mast are ripe. They there eat all kinds of wild fruits, and grow fat in a short time; especially if, at their return in the evening, plenty of lukewarm water be given them mixed with a little bran and the meal of tares; for this makes them sleep, and increases their flesh to such a degree that they are sometimes scarce able to move; but the fat thus acquired is disagreeably oily. They likewise fatten soonest in autumn,
when

when the weather begins to grow cold, because they then perspire much less than in summer, and have greater plenty of food. But the best way of all to fatten them for their flesh to acquire a fine flavour, and their fat to be firm and palatable, is, to shut them up for a fortnight or three weeks before they are to be killed, in a clean paved sty, without litter, and to feed them only with pure dry wheat, allowing them at the same time but very little drink. The hog thus treated should be about a year old, full of flesh, and previously half fattened; for the older the hog is, the longer time it requires to fatten, and its flesh is also proportionably worse.

Castration, which must always precede the fattening of any animal, is usually performed on hogs at the age of six months, and either in spring or autumn; but never in very hot or very cold weather, because each of these is equally dangerous to the wound, and renders its healing difficult; this operation, which every tinker knows how to do, being most commonly performed by incision, though sometimes by a ligature only, as in the ram. Those which have been castrated in the spring are generally fattened the next autumn, and commonly killed before they are two years old; though they grow very considerably in the second year, and would continue so to do for several years longer; those which are particularly remarkable for their height and corpulence, being only creatures of a greater age, which have been turned out several years to feed on mast. Their time of growth does not seem confined to four or even five years; for the boars which are kept for propagation continue to grow in their sixth year; and the older a wild boar is, the larger and heavier he becomes. It is true, that the head of an old

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wild boar is the only part worth eating; whereas all the flesh of the wild boar and sow not a year old, is delicate, and of a fine grain: but the flesh of the tame boar is still worse than that of the old wild boar, and can be rendered eatable only by castration and fattening, unless it be when made into brawn.

The antients used to castrate such wild pigs as they could at any time find means to steal away from their mother, and afterwards carried them back into the woods: the castrated wild hogs not only exceeding the tame in bigness, but their flesh being also better.

CHAP.

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C H A P. III.

Of the Propagation of Swine.

BOTH the male and female of this species of animals are able to copulate when only nine months or a year old; but it is better to let them double that age before they are put together; for the first litter of a sow, when she is not a year old, consists of only a few, and those weak, and even defective pigs. She may be said to be in heat at all times; and even when she is pregnant she seeks the boar, which, among animals, may be deemed an excess; the female in almost every species refusing the male after she has conceived. The heat of the sow, which is almost continual, declares itself more particularly at intervals, by her emitting no small quantity of a thick whitish liquid, and by uncommonly-violent motions which always end with her weltering in the mire. She goes four months, and farrows at the beginning of the fifth; soon after which she again grows eager for the male, becomes pregnant a second time, and thus farrows twice a year. The wild sow, which resembles the tame one in all other respects, farrows but once a year; probably because of the scarcity of food, and the necessity she is under of suckling and feeding all her litter for a considerable time: whereas the tame sow is never suffered to suckle all her pigs above a fortnight

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night or three weeks; after which eight or nine only are left with her, and the rest are carried to market. They are fit for eating in a fortnight; and as few sows are wanted, the castrated pigs being more profitable to rear, and their flesh the best to eat, most of the sow pigs are disposed of, only two of these, and seven or eight boar pigs, being generally left with the sow. She should never be permitted to suckle any of her pigs above two months; and even at the end of three weeks it is best to drive them to the field with her, that they may by degrees accustom themselves to feed as she does. In about five weeks after this, they are weaned, and whey mixed with bran, or at least warm water boiled with greens, is then given them morning and evening.

The boar for propagating should be short and thick of body, rather square than long, with a large head, a flat short snout, large flapping ears, small fiery eyes, a large thick neck, a swagging belly, broad buttocks, short thick legs, and thick and black bristles, white hogs being never so strong as black. In the sow, the body should be long, the belly broad and capacious, and the teats long. She should also be of a quiet disposition, and taken from a fruitful breed. When pregnant, she must be kept apart from the boar, or he would probably do her some mischief; and when she has farrowed, she must be fed plentifully, and also watched, lest she should devour some of her pigs: the boar especially must be removed, for he would shew them still less mercy. The sow is commonly put to the boar in the beginning of spring, in order that, by farrowing in summer, her pig may have time to grow and gather strength and flesh before winter: but when it is intended that

She should farrow twice a year, she is had to the boar in November, that she may farrow in March, and be again put to him in May. Some sows farrow regularly every five months. The wild sow, which, as was before observed, farrows but once a year, admits the boar in the months of January or February, and farrows in May or June. She suckles her young three or four months, leads them abroad, follows them, and keeps them from straying, till they are three or four years old; so that it is not uncommon to see wild sows with their young of the present and preceding year about them.

Wild boars are called *founders* during their first year, and *beasts of company* till they are three years old, because they keep together till that age, and never go alone till they are strong enough to encounter the wolf: by this means these animals compose among themselves a kind of Squadron, and in this their safety consists; for when they are attacked, the largest form themselves into a close circle around the lesser, to keep off the enemy. The same method of defence is also practised by tame hogs; so that there is no occasion to make use of dogs to secure them from beasts of prey.

It is not uncommon for boars to live twenty-five or thirty years. Aristotle says, that hogs in general live twenty years; and adds, that the boars engender, and the sows bring forth, till the age of fifteen.

I cannot conclude this last chapter of my work, without continuing to observe with M. de Buffon, that this species of animals, though known, and even found in great plenty all over Europe, Asia, and Africa, had never been seen in America till it was carried thither by the Spaniards, who turned great numbers of black pigs

loose on the continent, and also on it's larger islands, where they have increased prodigiously, and in several places become wild. They resemble the European wild boars; but their body is shorter, their head larger, and their skin thicker than in other hogs, which in hot climates are totally black, like the wild boar.

A ridiculous prejudice, which owes it's continuance to superstition, deprives the Mahometans of this animal: they are taught to look upon it as unclean, and are so far from eating, that they dare not even touch it. The Chinese, on the contrary, are very fond of hog's flesh: it is their most common food, and is said to have animated them to refuse the doctrine of Mahomet. The Chinese hogs, which are the same with those of Siam and India, differ from those of Europe, in that they are smaller, their legs considerably shorter, and their flesh much whiter and more tender. Some persons breed them here, and they copulate and engender with our common swine. The Negroes also breed vast numbers of hogs; and though they are very scarce among the Moors, and in all Mahometan countries, wild boars abound as much in Asia and Africa as in Europe.

C H A P. IV.

Of the Diseases of Swine.

THE only disease that I know of which seems to be peculiar to swine, is a kind of leprosy, commonly called *measles*. When it seizes them, they become dull and sleepy. If the tongue is pulled out, the palate, throat, and it, will be found full of blackish spots, which appear also on the head, neck, and the whole body; the creature is scarce able to stand on it's legs, and the roots of it's bristles are bloody.

As this disorder proceeds chiefly from their gluttony and filth, the only way of preventing it is, as was said before, to keep them clean; and the most probable way to remedy it is, to put the diseased hogs into a separate clean sty, and there give them wholesome food; to wash them carefully, and let them have plenty of water to wallow in: antimony, and it's preparations, will also be of service to them,

B O O K VIII,

OF THE CONTAGIOUS DISEASES OF
CATTLE *.

THE contagious diseases which have attacked cattle at different times are not all of the same nature. The authors who have noticed them, have given different descriptions of them. I shall first describe those of which they have spoken, and then proceed to those which have appeared in our days. It must be from a knowledge of what was observed in former epidemics, that we can learn to guard against the dire effects of future ones; for it is but too certain, that those which have already appeared will appear again, as there will hereafter be occasion to remark: and the proper treatment of diseases which may hereafter attack cattle, can be learnt only by considering what was done for them before: for, as in the cure of diseases incident to men, so in those of animals, experience is all in all. Experience makes us acquainted with each species of malady, it's genus, the different causes which have contributed to it's production, the

* Abridged from *Mémoire sur les Maladies épidémiques des Bestiaux*, par M. Barberet, M. D. to which the Royal Society of Agriculture at Paris adjudged their premium for the year 1765, and of which they were pleased to transmit a copy to the writer of this work.

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remedies which have been applied, and their effects. "Be always mindful," says Hippocrates (a), "of whatever has cured diseases, of the appearances under which those diseases have shewn themselves, of the changes they have undergone, and of the different manners in which they have affected different creatures; for this is, in physic, the beginning, the middle, and the end."

The antients afford us but little instruction concerning the contagious diseases of cattle, a scourge which so often sweeps away whole herds; for they scarcely enter into any description of them. Virgil, at the end of his third Georgic, describes, indeed, a mortality amongst cattle; but what he says is rather the flight of a poet's imagination, painting the ravages of any epidemic disorder, than the description of a particular one: and though we find in Celsus prescriptions for many maladies of horses, oxen, and sheep; yet he has not given us a description of any epidemic disorder: nor is Columella at all accurate in his description of the contagious diseases of cattle.

We must therefore come so far down as Ramazzini, who, in his account of the epidemical constitution of the year 1690 at Modena, says, that the season was cold and moist, and that the reigning distempers of that year attacked all the people who lived in the country, and spread itself indiscriminately amongst all kinds of animals, of which great numbers died after a few days illness. Nature made strong efforts to disengage herself from the disease by a critical discharge on the thighs, neck, and head, resembling the pustules of the small-pox. Most of the animals which had this appearance lost their eye-sight.

(a) *Lib. de decent. Ornat.* § 8.

Those creatures which were not carried off by this disease, but resisted it's first violence, lost their flesh by degrees, and fell into a marasmus. Ramazzini did not scruple to declare these pustules to be the small-pox; for they differed not from it in form, in colour, or in the matter which they contained, nor in size, nor in the manner in which they went off: when they had dried off after the suppuration, they left a black scar, like to that which remains after the small-pox.

This epidemic contagion continued in 1691, and attacked chiefly the sheep, so violently that the breed was almost destroyed: (*Ita ut ovilus grex penè deletus fuerit.* Ramaz. p. 42.) It has been constantly observed, that, of all animals, sheep are the most subject to the small-pox. The French call it, in them, *clavin*, or *claveau*, and I shall speak more fully of it hereafter. It was therefore to be expected that they should be particularly affected by it, since they are more disposed to it than other cattle.

In 1693, Hesse saw her herds carried off by a pulmonary phthisis. (Const. epid. Hassiac. ann. 1691.) The winter of that year began with rain, and ended with very severe cold: an extraordinary warmth, which commenced in the spring, and continued during the whole summer, took place all at once of the former cold. Such sudden changes always occasion unusual motion in the fluids, and frequently obstructions in the capillary vessels; and hence it seldom happens but that a sudden change from cold to heat brings on epidemical diseases: yet the disorder which then reigned in Hesse was also attributed to a blight, or corrosive dew, which fell on the pastures in 1693, in the same manner as the pastures in Italy had been infected in 1690. Besides these

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these causes, the above-quoted observer imputes the disorders to the coldness of the water, which, the animals drinking greedily of it whilst they were very hot, contributed much to the pulmonary phthisis: for if a man in a great sweat drinks a draught of ice-water, it is to be feared that he will be seized with a pleurisy or peripneumony. The case is the same with animals.

The spring of the year we are speaking of being very warm, the bullocks and cows, heated both by the warmth of the season, and by the devouring fire which raged in their bowels, through the infected quality of the plants they had fed on, ran to the coldest water they could find. One of the first effects of cold is to condense fluids, and to lessen the diameters of vessels. The fibres of the capillary vessels, being contracted by the action of the cold, stopped and returned the blood which before flowed freely in those vessels, and from thence proceeded an inflammation. When this happens to a considerable number of vessels, they burst, and their coats with their contents turn to pus, or that matter which we see in boils. This is what happened in Hesse: the inflammation, at first neglected, suppurated, and the cattle sunk under a pulmonary phthisis.

In the year 1712, they were attacked in Lower Hungary with a most dangerous distemper, (*Const. epid. inter Hungar. ann. 1712*). The winter had been extremely cold; and the spring rainy, with great changes in the temperature of the atmosphere; for on the same day the morning was cold, the middle of the day very warm, the cold began again about three o'clock, and the evening became warm. These changes occasioned amongst men many fevers, which were as irregular as the season. In the months of June and July, during which the weather continued constantly

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stantly warm, there appeared a prodigious number of insects, reptiles, and particularly serpents which killed many persons in the country. Their bite brought on a swelling which spread very fast all over the body, and particularly to the tongue, so that the sick could not utter a word. The cattle were not less subject to the bite of these serpents, than the men; and accordingly the mortality among them was very great.

In August, which was very rainy, the mortality increased, but by a new kind of disorder, which shewed itself by white pustules filled with matter insufferably stinking. A liquor of a cadaverous smell flowed from the mouths of the sick cattle; it was with the utmost difficulty that they breathed: the bullocks and cows seized with this disorder bellowed constantly, and without intermission, as death approached. A noise was then heard in their bowels, as if the coats of their intestines, distended too much, burst. Though the observer does not mention it, yet every circumstance, especially the pustules, declare this distemper to have been the small-pox complicated with some other disorder. The liquor which flowed from the mouth greatly resembled the spitting which comes on in men in the small-pox. The difficulty of breathing, the stench of the breath, and the infectious smell of the pustules, are symptoms which constantly attend the *clavin* or small-pox in sheep, when the disease is violent or accompanied with putrefaction.

In the stomach of the animals which were opened were found balls of the size of a walnut, filled with hair, and covered with a membranous tunic, so hard that it could scarcely be cut with a knife. This membranous tunic is uncommon; for the egagropiles are not organized bodies.

This

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This mortality spread even to the wild beasts, several of which were found dead in the forests. The dogs which ate of their flesh, or that of any of the animals which died of the contagion, became mad; and the men who were bitten by them were seized with the hydrophobia.

The changeableness of the season had a great share in the epidemic here spoken of, and the multitude of reptiles contributed to render it still more dangerous to cattle: for the great number of insects which adhered to the grass they fed upon, might cause as many disorders as the blight before-mentioned; because all animal substances are of a more septic quality than grass, which is the natural food of cattle.

The epidemic disease of 1711 (*b*), which made such havock in Italy and Germany, came originally from Hungary, by means of bullocks brought from that country: for there appeared nothing in the constitution of the air, nor in the food, that could give rise to it; nor did it affect cattle which had no communication with those that came from Hungary. The infection seemed to be communicated by their saliva dropped on the grass; so that sound cattle which afterwards fed on the same pasture contracted the disorder with which the others were infected.

The virus, which was communicated by the saliva, was so extremely acrid, that it acted as a caustic on the gullet, stomach, and intestines, affected the nervous system, occasioned spasms, contracted the fibres, and caused obstructions in the capillary vessels: the fluids consequently became putrid, and the bowels were seized with gangrenous inflammations. The disease was attended with a burning heat, a total loss of ap-

(*b*) *Const. Epidem. August. ann. 1711, 1712.*

petite,

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petite, a difficulty of breathing: in some bullocks the tongue was inflamed and covered with many red blisters; the stomach, the epiploon, and especially the intestines, were also inflamed; the parts near the liver were of the colour of the bile; the excrements were purulent, tinged with blood, and of an insufferable stench, so that, says the observer who has left us this account, the disorder assumed the appearance of a malignant dysentery: and yet the dysentery here certainly was only symptomatic.

The mortality amongst the cattle ceased but very little during the winter, and began again the next year: the cause, however, did not seem to be the same; for the epidemic disorder in 1712 appeared with different symptoms. It first attacked the horses, especially those which were in the neighbourhood of Augsbourg; yet almost all that were in the town escaped. It afterwards spread to the bullocks and cows, and to many other animals of different kinds. On the breast, groin, and many other parts, there arose hard tumours, which extended greatly, and soon carried off the cattle affected with them. This disorder seems to have been the consequence of that of the former year; the hard tumours and the symptoms attending them being imputed to the sting of hornets, of which there was an incredible number in 1712, of an uncommonly large size. It was said, that they fed on the bodies of the cattle which died the year before, and had not been buried sufficiently deep. That the sting of these hornets bred in and fed on infection, could not but be dangerous, will appear from the following event, which shews to how great a degree the juices were altered.

A man intending to chop off the foot of a horse which had died of the sting of a hornet,

and

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and had not been buried deep enough, the foot appearing above ground, some drops of the juices splashed about by the hatchet he made use of flew into one of his eyes, and caused there an inflammation and swelling, which soon extended to the other eye, afterwards over the whole head, and finally killed him.

Lancisi informs us, that the wise precautions of Pope Clement XI. preserved for two years the states subject to him, from the contagious disease which a bullock had brought from Hungary into the district of Padua, from whence it had spread all over the Venetian territories and the Milanese, and at length penetrated into the kingdom of Naples. In the middle of the summer of 1713, information was received, that some drovers were conducting a great number of cattle to the fair of Frusino, a town in the Ecclesiastical State, but bordering on the kingdom of Naples. To prevent all danger, orders were immediately given, that the fair should not be held. The drovers, seeing the impossibility of selling their cattle as they had intended, led them through bye-ways to Rome. They were sold at a low price; and being sold again to the inhabitants of the towns and villages throughout that province, the infection was soon spread over the whole Campania of Rome. An exact register was kept of all the cattle that died from the month of October 1713, to the month of April 1714, when the infection ceased in the Ecclesiastical State, and presents us a shocking detail of the effects of that pestilence, by which were destroyed 8466 oxen used for ploughing, 10125 white cows, 2816 red cows, 108 breeding bulls, 427 young bulls, 451 heifers, 2362 calves, 862 buffaloes male and female, 635 young buffaloes, in all 26252 cattle, in the space of nine months. Lancisi thinks,

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thinks, that if the computation had been begun from the 2d of August, the number of cattle which perished would have amounted to 30000.

That author does great justice to the truly paternal care and solicitude shewn by the holy Father on this melancholy and fatal conjuncture. We may see by his account, that the speedy extinction of a scourge which continued long to ravage other states of Italy, was owing more to the Pope's prudent measures, than to medicines, which were found to be ineffectual. - This evinces, that good laws and active magistrates are frequently the most effectual safe-guards against pestilential diseases.

This distemper shewed itself in some animals by lowings, by a kind of terror with which they were seized, by a thousand different motions which seemed to arise from that terror, and by a sudden and precipitate flight. Others, chiefly the weak, dropt down dead at once, as if they had been thunder-struck. In almost all the rest was observed a great dejection; they could hardly hold up their heads; their eyes were dull and full of tears; a surprizing quantity of mucus flowed from the nose, and of saliva from the mouth; the fever in them was very high; they were so dejected that they could not stand up; their hair stood on end; their tongue, mouth, and gullet were inflamed, ulcerated, and more or less covered with blisters: at first they shewed a great thirst, but soon refused every kind of drink and food: many had a considerable purging; what they discharged was of different colours, always very foetid, and sometimes bloody. Most of them sunk under the distemper in a week, being seized with the most violent oppression. Their breath was insufferably stinking, a
strong

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strong cough was frequently joined to all these symptoms, &c.

It was seldom that the appearances in the viscera were alike in the creatures which died of this plague. The contagion fell sometimes on one part, and sometimes on another, seemingly according to the weakness of that particular part. This Lancisi says he was convinced of by opening three bodies. Except the small ulcers observed in the mouth, throat, œsophagus and paunch of each of them, and likewise the gangrenous spots observed in their lungs, all the other effects were totally different. In the paunch of the first, which died on the third day of the disease, he found a mass of the creature's last food, extremely hard, and what Pliny calls *juvencarum topium*, that is, an ægagropile. The liver, intestines, and lungs of the second, which died on the sixth day, were intirely sphacelated; the heart and brain of the third were become putrid masses, with scarcely any vascular appearance. He observed nothing particularly remarkable in the fluids.

The young and fat cattle, which had worked little and been well fed, were more easily affected by the distemper, and died sooner, than the cattle which had been made lean by hard labour, and were come to a certain age.

Lancisi thinks that the greater or less abundance of the fluids, and their flowing more or less freely through the vessels, was the true cause of this difference; for the pestilential ferment, says he, insinuates itself more easily into the blood and spirits, and falls more severely on the bowels, when it meets with a greater plenty of fluids liable to be corrupted, and with obstacles which prevent it's finding a passage out of the body.

Though

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Though the lean cattle did not escape the contagion, and though they generally died of it, yet some of them recovered; probably owing to the less interruption which the pestilential ferment met with in them, than in those that were fat.

What was very remarkable is, that most of the female buffaloes which were seized with the plague when they suckled their young, did not die. Their teats were ulcerated all over, and none of their young escaped. Lancisi is of opinion that the acrid venom taken in by the nose of the mother, and with her food, flowed with the chyle into the blood, and by that means into the minutest vessels of the udder. There it happily deposited; and as part of the venom was taken off by their young, and the rest of it remained stopped at the extremity of the lactiferous vessels ulcerated and corroded by that same ferment, the mothers, by means of these salutary sores, frequently escaped death; perhaps as happens to men seized with the plague, who are often cured by a lucky suppuration of buboes.

In the year 1730, a great number of cattle died in Bohemia, Lithuania, Saxony, the Marche of Brandeburgh, and the Dutchy of Magdeburgh (*Hist. Feb. Catarrh. ann. 1730*); but we have no account of the distemper which carried them off. Perhaps it might be like that which destroyed so many in some of the provinces of France in 1731, the first symptom of which was a white blister that appeared on the tongue. This blister afterwards became red, and ended with turning black and degenerating into a cancerous ulcer, which ate away, and, in a short time, consumed the whole tongue. It was very like an anthrax. This distemper was the more dangerous, because there was no symptom which declared it's approach;

for

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for the creature which was seized with it ate and drank as usual, till the ulcer had made a considerable progress, and often nothing was perceived till it was too late to assist.

From the year 1740 to 1750, the horned cattle, not only in France; but all over Europe, died in vast numbers of a putrid, malignant, inflammatory fever, like that which made such havock in Germany and Italy in 1711, and which was called a malignant dysentery. Of all the diseases that have at any time attacked cattle, this seems to be the most dangerous; the most complicated, and the most difficult to cure. It's approach was indicated by a languor and general dejection: the beating of the heart was as quick-again as in a natural state, which denotes a very brisk fever. The sick animal, hanging down it's head, could hardly stand upon it's feet; it tottered; it's loins panted; it's eyes were red and full of tears; it's horns and ears were cold; a thick glutinous slaver ran from it's nose and mouth; and a convulsive motion was apparent from the head all along the back. The other symptoms were similar to those before mentioned in speaking of the epidemical disease of Augs-burgh.

In 1756, the French lost a great number of cattle in Minorca. These animals, transported thither from Auvergne, were little accustomed to the heat of a climate where they were exposed all day long to the burning rays of the sun: for, excepting the middle of the island, scarce any shade is to be found in it. This became the more grievous to them as they naturally delight in a cold climate, and in such it is that they thrive best. In fact, the cattle of Denmark, Podolia, and the Ukraine are the largest, and next to them those of Ireland and England, whilst

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those

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those of Spain and Barbary are the smallest. They found not in Minorca any thing that could allay in their bowels a heat which they had not felt elsewhere. They had no cooling grass, for all is burnt up in that island by the month of May. The water, being every where warm and in many places brackish, afforded but little refreshment to creatures which love it cool and pure. They languished, and lost their flesh visibly from day to day: their breath was hot, and they ended with pissing blood.

We were terrified in 1762 with accounts of an epidemic disease which made great havock in Denmark, and had advanced to the frontiers of Germany. The following is an account of it, sent to one of the Members of the Royal Society of Agriculture at Paris.

“ The contagion spread with great rapidity; the youngest, the most robust, and the most healthy cattle were the first seized with it, and died the soonest. In most of them a cough was the symptom of the disease. Their eyes became dull, watery, and bleared; and even tears trickled from them. In a day or two after the cows were thus seized, their milk dried up, and this was a sure sign that the contagion had reached them. In the beginning, the creatures were cold even to shivering, nearly as men are on the first attack of a fever. A heat succeeded, and continued for several days: it was most perceptible at the nape of the neck, either by the heat itself, or by the beating of the pulse. The sick animal lost it's appetite for eating, but continued to drink freely till the inflammation deprived it of the power of swallowing. A great quantity of insufferably-stinking snotty matter flowed from the nose, and the teeth be-

“ came

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“ came loose in most of them. Some became
 “ costive; but in much the greater number a
 “ diarrhæa came on in the beginning, with a dis-
 “ charge of scarce any thing except water, with
 “ very little excrement. Towards the end of the
 “ disease, the two last joints of the tail became soft
 “ and rotten: if the skin which covered them was
 “ opened, there came out a foetid purulent mat-
 “ ter. The gangrene proceeded by degrees even
 “ to the horns, which became cold and empty.
 “ When the ears and nose became cold, the dis-
 “ ease was in the last stage; and then it was that
 “ the animal generally died, on the sixth or se-
 “ venth day from it's being taken ill.

“ On opening the dead bodies, the gall-bladder
 “ was found greatly enlarged, and full of a li-
 “ quor more like urine than bile. In some of
 “ them there was even three pounds weight of
 “ this liquor in the bladder; in many, the sto-
 “ mach and intestines were full of worms yet
 “ alive at the opening of the body. There were
 “ likewise in the blood-vessels certain insects
 “ called *plaice*, because of the resemblance of their
 “ shape to that of the fish so named. Some-
 “ times the brain appeared dissolved into a puru-
 “ lent water. In many, the veins were full of
 “ black blood. Numbers had the neck inflamed.
 “ In others, the inflammation fell on the bowels,
 “ and sometimes another part of them was found
 “ gangrened. The stomachs were full of food
 “ not digested; and that food was so dry, and
 “ so much compacted together, that it could not
 “ be separated without great difficulty. Livid
 “ and black spots on the stomachs and intestines
 “ shewed evidently a gangrene. In some ani-
 “ mals, the liver and spleen were covered with
 “ small tumours so hard that they could not be

“ broken, and they felt like grains of small sand
 “ under the fingers; while the rest of the substance of these viscera was, on the contrary,
 “ so soft, that it could scarcely be touched without piercing into it. Some dead bodies afforded no sign of any distemper. The blood
 “ that was taken from the animals was of a clear red, and discovered signs of great inflammation by it's frothing and smoaking, and not
 “ having any liquid in it after it had cooled: the whole was one coagulated mass, which
 “ might be cut like a jelly.”

In the years 1746, 1754, 1761, and 1762, there appeared among the sheep in the neighbourhood of Beauvais (in Picardy) a contagious disease which the French commonly call *clavin*, or *claveau*, and which is in fact no other than the small-pox, as was before observed. It is, of all the contagious distempers which affect sheep, the most easily communicated, and that to which they are the most liable. Like the small-pox too it is distinguished into the distinct or mild, and the confluent or malignant.

The Royal Society of Agriculture at Paris having received the following very particular account of this disease, as it appeared in 1762, from M. Borel, Lieutenant-general of Beauvais, and Member of the Society of Agriculture of that city, gladly pay him the tribute of praise justly due to the zeal and diligence which he manifested on this occasion. He himself examined the condition of the sheep in many villages and hamlets, in order to become perfectly acquainted with the symptoms of the disorder, which he has described with a precision that shews he judged and saw with his own eyes.

The disorder manifested itself by a want of appetite and a dejection in the animal. Some perceived

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perceived it twenty-four hours before the eruption; the most attentive perceived it two or three days sooner; but the greatest part did not notice it till after the eruption had begun. The disgust was proportioned to the degree of the malady; for the sheep that were affected continued to eat, those that were most severely attacked took no food of their own accord, people supported them as well as they could; they were very thirsty, and water was given to them all. As soon as they were seized with the disorder, they ceased to chew the cud; their eyes were heavy, swelled, and watery, they became very dim, and frequently the eye-lids were so glued together, that the creatures could not see. Many of those which had been cured had lost one eye, and others were quite blind: a deposit or translocation of the pocky matter being made, brought on a suppuration which destroyed the whole substance of one or both eyes; but these deposits contributed much to a recovery. There flowed from the nose a thick tough matter, of the colour of pus, generally white, seldom yellow. Their strength failing them to follow the flock, they laid down, and remained in the place where it may be said they fell. Their ears were very cold; though this was not always the case. They were quite motionless, and collected into the smallest compass possible, with the head inclining as much as could be to the ground, the tail drawn in between the legs, and the hinder parts brought near to the fore ones without seeming to be griped. The oppression they laboured under was in proportion to the violence of the disorder. When the attack was mortal, they groaned during the last twenty-four hours of life, and their loins palpitated strongly. If they recovered, their wool fell off from the places

where there had been an eruption. Their excrements were nearly the same as in a state of health, but rather dryer, and blacker than in the natural state. The pimples resembled exactly those of the small-pox. They were of different forms and different colours. Some were perfectly round and distinct; others confluent and of an elliptical shape. All of them were at first red and hard. The distinct sort became afterwards white and soft, suppurated, dried up, and fell off in scales. In the confluent kind, the pimples were so near together that they touched each other; they became of a purple colour, and instead of rising and turning white, they appeared flat and became black. The fever, heat, thirst, and dejection continued, attended with a difficulty of breathing, and working in the loins. Some died so early as the third day after the eruption. The more the head was affected, the greater was the danger, and the speedier the death. Those that outlived the disorder, were long in recovering. Some did not recover in less than two months, others at the end of six weeks, or a month: in the distinct kind, they generally recovered in a fortnight: but in both sorts, several died at the end of these periods. People were at first of opinion, that the sheep fed in moist pastures were more liable to be seized with this disorder than those fed in dry pastures: but it was afterwards observed that there was not any difference between them. The sheep were seized in the winter as well as in the summer. In several places, the infection spread without any immediate communication with the sick sheep: in others, it seemed to be the effect of their coming near to one another. The eruption appeared chiefly on the head, on the inside of the fore and hind legs, on the belly, and around the anus. Some sheep
had

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had but very few pimples. These the country people called the flying small-pox. Some had pimples only on their legs, others on their ears only, and some again had only one cluster of the breadth of a crown-piece. A sheep had such a cluster on one ear, which it treated so roughly that the ear remained curled up, and displaced from it's natural position. Another had one on it's foot; the hoof fell off, and the creature remained lame ever after. The eruption was generally complete by the fourth or fifth day. The inside of the mouth was full of pimples, which would have prevented the sheep's eating even if it had not had a disgust to food. The breath was excessively stinking. M. Borel observes, that when a flock of sheep was seized with this distemper, at least one half or two-thirds of them were very sick. In most places, no attempt had been made to cure it, the country people being persuaded that there was no cure for it, because they had never seen their fathers administer any; only some of them assured him, that the open air was better for the sick sheep, than housing them.

This gentleman, not contented with examining the symptoms of the disease in the living, endeavoured to discover it's effects in the dead bodies. A sheep which was first observed to be sick on a Thursday, continued in the field all Friday, and on Saturday morning was found dead in the sheep-fold: it was brought to M. Borel in the afternoon of the same day; signs of putrefaction appeared already in it by an offensive smell, by a livid greenish colour upon it's neck and under it's fore and hind legs, and by the largeness of it's lower belly, which inclosed a great deal of infected air. This sheep had not any pimples on the head, nor was that part of it at all swelled; only two pimples were found on the upper, and

two on the lower part of the tongue; and in those places the skin peeled off as it does from a tongue put into boiling water. On raising the eye-lids, it was seen that the eyes had lost their brightness and transparency, and that more in one than the other. The pimples were numerous on the belly, under the fore and hind legs, and on the neck and throat.—They appeared like tumours or white pustules, round, flat, and of a sixth, a fourth, or a third part of an inch in diameter. They did not pierce deeper than the skin, and moved with it. The matter of which they were formed had not yet made pits, as in the white pustules of the small-pox. On opening them, they appeared like a pinguous tumour; some were excoriated in the middle. It was presumed that they had not become white till after the death of the creature, and that they were red before, as in the other sheep during the first days of the eruption. The remains of a sanious humour, of the colour of coffee, were found in the nostrils; but no judgment could be formed of its mucosity at the end of twelve or eighteen hours after death, when a putrefaction had begun. The lower belly being opened, the cawl appeared of a dead blackish red, and the fat of it had not that cohesion and consistence which it has in sheep killed when in health. The liver was of a dark-green colour; which colour penetrated about a twelfth part into the substance of it, in some places more, in some less, and the part so coloured was brittle, as if boiled. The gall-bladder was flabby, and seemed to have contained more bile, and that thinner, than in its natural state. The inner coat of the first stomach was loose and wrinkled, of a green colour, and prodigiously full of white lenticular pustules, of the same nature as those on the skin, but smaller

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in diameter. This stomach contained a greenish liquor in small quantity. The second stomach contained also but little. The third was very full of food pretty well chewed, and as green as the grass of which it was the produce. It was also much extended with a very rarefied and fetid air. The small guts were almost empty. In the colon and cæcum were excrements of a middling consistence. The kidneys were like the liver, green and dry on the outside. The bladder had little urine in it. The lungs were flabby, and of a dark livid red. Some small tumours were observed in them, like those on the skin, but round and thick. The heart appeared larger than in it's natural state. The right ventricle contained a very black blood: a clod of blood taken out of the inferior vena cava was black in it's upper part next the heart; but in it's lower part next the liver it was yellow, and resembled that coat which covers the blood in pleurifies. The head of this sheep was not opened, as well on account of the putrefaction, as because the disease did not seem to have fallen on that part. M. Borel adds, that if a child had died at the same period of a disease, and with the same symptoms, it would be thought to have died of the small-pox stricken in. The resemblance between the *claveau* in sheep, and the small-pox in men is very striking, whether we examine it in it's beginning and progress, or in it's effects and consequences in the sheep that were cured. In many of these the skin of the head, especially about the lips, was seamed as the skin of a human face is by the confluent small-pox.

It were to have been wished that M. Borel's occupations had permitted him to notice with the same care and exactness the effects of some medicines, which were pointed out to him at
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the time by one of the members of the Royal Society at Paris, and to pursue the experiments then proposed to him. The questions which that society put to him may, however, help to direct others on a similar occasion; and I shall therefore transcribe them here.

1st. Are old sheep more subject to the *claveau* than young ones? Is the *claveau* apter to be of the confluent or malignant kind, and consequently more dangerous in the former, than in the latter? M. Borel answered, that no difference had yet been observed between the old sheep and the young, with regard to the height to which the malignity or other symptoms arose. The society, however, wish that this important point may be ascertained by more accurate observations.

2d. Are the lambs subject to this disorder? Is the distinct or mild kind the most common amongst them? Are they subject to a looseness in either kind of this distemper? Have they the discharge by the nose in the confluent kind? Does this discharge precede or does it accompany the eruption?

3d. At what time precisely does the eruption appear, and how long also does it last, in the one and in the other kind of this disease? Does it vary according to the kinds of the disease, and according to the age of the animal?

4th. After the eruption, are the symptoms lessened in the distinct kind? Do they become more alarming and seem to increase in the confluent kind?

5th. Is a sheep which has recovered of either the one or the other kind of this distemper, ever attacked with it a second time, or oftener?—The country people assured M. Borel, that they never knew a sheep attacked a second time by it.

6th.

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6th. Could not inoculation be tried on a sound sheep, or on an uninfected lamb, which has been prepared before-hand? What would be the issue of such an experiment, made with all possible precaution to guard against the spreading of the contagion.

7th. If a sheep cured of the *clavéau* in the natural way is inoculated, will it be infected?

8th. What would be the consequence of inserting some of the variolous matter into an ass, a mule, a horse, a bullock, a dog, or, in short, into any animal of a different kind? What would be the effects of inoculating a sheep, or other animal, with the variolous matter taken from the human body?

9th. Prepare some sheep as for inoculation, and expose them afterwards to be infected in the natural way; will they be infected, and of what kind will the infection be?

10th. Inoculation not having had any effect, expose the sheep to the *clavéau* in the natural way, will they be infected?

Plenciz, a celebrated physician at Vienna, in a treatise on contagious diseases, printed by Trattner, in 1762, has taken into consideration, in p. 142, &c. the havock made by the distemper among cattle for thirty years past, in almost every country in Europe. He ascribes the cause of it to small worms, and founds his opinion on what he observed by the help of a microscope in the several ulcers which extend from the mouth and throat to the stomach and lungs of the distempered animals. He cites the testimony of Rodius, *Cent. 3, Observat. 61, & 62.* that of Bidloo, and that of Bono in his letters to Valisnieri.

The progress of this cruel disease having been such towards the end of the year 1761, that the symptoms of it became daily more and more severe,

vere, this zealous author determined to search first into the cause of it's spreading so rapidly, and next into the means of getting the better of it. These two points are the subject of a small work serving as a supplement to that we have been speaking of, viz. *Additamentum ad Tractatum de contagione*, p. 142, 143, 144, &c. seu de lue bovina ad finem vergente anno 1761, epidemia grassante, &c.

Michael Sagar, Physician in the Circle of Ig-law in Moravia, has given us the history of a distemper which reigned among the cattle in 1764. It was printed in 1765, by Kraus at Vienna, under the title of, *Libellus de aphthis pecorinis anni 1764, cum appendice de morbis pecorum in hac Provincia tam frequentibus, eorundemque causis et medelis preservatoriis*.

These two works contain excellent observations, and cast a great light on the subject; as does also the work of M. Ens, intituled, *Disquisitio Anatomico-pathologica de Morbo Boum Ostervicensium*.

We find in the second volume of Sydenham's works printed at Geneva in 1736, by the brothers Detourne, not only all that Bernard Ramazzini has said of the constitutional epidemics of 1690, 1691, 1692, 1693, and 1694, but likewise a collection of what Schröeck, Harder, Valentinus, Garhliep, Behrens, Rayger, Stegmann, Schelhamer, Hoyer, Gerbezius, &c. have written on the epidemical constitutions of different countries at different times. They have all been sufficiently attentive, whenever the contagion extended to any kind of cattle, not to neglect this circumstance, though it was not, so much as might have been wished, the principal object of their writing. We are, however, obliged to Physicians who, whilst they search into the causes
of

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of diseases fatal to men, at the same time cast an eye on those of cattle. *Sunt enim animalia post hominem, ita ars veterinaria post medicinam secunda est.* Veget.

Of the Causes of the contagious Diseases of Cattle.

THE constitution of the air, and the quality of their food, are the original causes of all the epidemic diseases of cattle. They breathe the same air as we do, and consequently must be affected by it's various temperature, it's changes, it's gravity, it's lightness, it's greater or less elasticity. The vapours, the exhalations, and whatever it carries with it must make on them at least as much impression as on us, and even more, since, not being cloathed, as we are, they are more exposed to the immediate contact of the air; so that what is contained in the atmosphere finds an easy admission by the mouth and nose, and being lodged in their hair, may insinuate itself into the body, and so occasion many disorders.

It appears that whatever in the air is hurtful to animals, affects them chiefly by the mouth and nose: for these effects generally shew themselves first in the head or stomach, and frequently in both at once. Hoffman is clearly of opinion that morbidic ferments are mixed with the blood by means of the saliva, more than by any other means. That liquor, whether it be swallowed constantly, or only when it accompanies the food, carries the ferment with it into the stomach and intestines, where, mixing with liquors easily susceptible of putrefaction, or of being affected by any particular ferment, the liquors are in this depraved state carried with the chyle into the body, and there produce effects similar to their different qualities,

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qualities, either on the body in general, as in a fever, or on some particular part: whereas if the venom entered by the pores, it would meet with liquors in continual motion, and therefore not so susceptible of putrefaction, or of being affected by any peculiar ferment.

That the air is the great source of contagious distempers, was an opinion of the most antient writers. Hippocrates (*Seet. 4. de Flatibus*) looks upon the air as the source of all disorders. Virgil (*Georg. Lib. 3.*) promises to teach us the causes of all the diseases of cattle; *Morborum quoque te causas et signa docebo.*

“ The causes and the signs shall next be told,

“ Of ev’ry sickness that infects the fold.”

Yet he mentions only the air, as if that was the sole cause.

*Hic quondam morbo cæli miseranda coorta est,
Tempestas, totoque autumnu incanduit æstu,
Et genus omne neci pecudum dedit, omne ferarum,
Corrupitque lacus, infecit pabula tabo.*

“ Here from the vicious air, and sickly skies,
“ A plague did on the dumb creation rise:
“ During th’ autumnal heats th’ infection grew,
“ Tame cattle and the beasts of nature flew;
“ Pois’ning the standing lakes, and pools impure:
“ Nor was the foodful grass in fields secure.”

Livy too (*Lib. V. Decad. 1.*) seems to impute to the air, a pestilential disease which carried off both men and animals in his time.*

Though the air is unquestionably a most powerful agent in communicating contagious diseases, yet it is not the only one; for if it were, how

* *Tristem hyemem sive ex intemperie cæli raptim mutatione in contrarium factâ, sive aliâ de causâ gravis pestilensque omnibus animalibus æstus excipit.*

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comes it that the pestilential diseases which at different times have destroyed mankind, have spared the beasts of the field? Thucydides, in his description of the plague of Athens (*de Bell. Pelopon. Lib. 2.*) does not say that it extended to beasts: he only relates, that the carnivorous animals would not touch the bodies of those which died of the plague, and that those which were so voracious as to eat of them died; which is a tacit proof that the other animals did not die of it. The plague ravaged the Roman Empire during fifteen years under the Emperors Gallus & Volusian (*Zonar. Tom. 2.*): in the year 263, it killed five thousand people in one day in Rome only (*Baronius, Annal. Tom. 2.*). Under the Emperor Justinian, there died of the plague at Constantinople, from five thousand to ten thousand people likewise in one day (*Procop. de Bello Pers. Lib. 2.*). Guy deChauliac speaks of a plague which appeared in his time, viz. in 1348, so extremely severe, that it swept away three fourths of mankind from off the face of the earth. According to Rondelet, it made dreadful havock in France, Germany, Italy, and Spain, in 1450. Valeriola says that, in 1553, men dropt down dead of the plague in Narbonese Gaul, whilst they were talking together or walking, as if they had been struck with thunder. Jerom Mercurialis relates the same thing of that which appeared at the same time at Padua and at Venice. Zacutus speaks of a most dreadful plague which happened at Lisbon in 1601. In fine, it appeared in Muscovy in 1655, in England in 1665 and 1666, in Poland in 1708 and 1709, at Marseilles in 1720; and yet the authors who have spoken of these terrible scourges make no mention of their having affected any other creatures than mankind. Can it be supposed that all of them neglected

neglected or forgot a circumstance of so great consequence? Their silence is a convincing proof that all epidemical diseases do not arise solely from the constitution of the air.

It may be objected, that as the air acts differently on different bodies, so the diseases which the air communicates to men may not affect other animals, nor those which are peculiar to any one species of animals affect any other species: for what proves mortal to one species does not to another; and that there is a plague for men, another for horses, another for cattle, and another for sheep. A sound bullock put into the same stable with a glandered horse does not catch the glanders. A bullock put into a house with sheep ill of the small-pox, does not catch that disease, nor do horses; and sound sheep do not catch the glanders or farcy from horses, when confined with them in the same stable: and yet one should be cautious not to mix sound animals of any species with diseased ones of any other: for men who had not so much as a scratch on their hands have been seized with a true anthrax by opening the bodies of cattle dead of a contagious distemper; and almost all the cow-herds who were appointed to watch an infected herd, have been seen to fall into malignant fevers accompanied with a gangrene.

Independent of the air, it is certain that many epidemic diseases take their rise from the bad qualities of food. If the bread-corn is any way distempered, it never fails to bring on disorders among the country people; of which a remarkable instance is recorded in the History of the Royal Academy of Sciences for the year 1710; viz. that the peasants of Sologne who lived on rye which had the spur were seized with a dry black gangrene, which began in the toes, ascend-
ed

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ed insensibly, and made their limbs drop off, in such manner that some of them were alive in the Hotel-Dieu at Orleans with nothing left but the trunk of the body *. Grass equally distempered becomes equally pernicious to the cattle which are fed with it. The distemper in grass called rust (*ærugo* & *rubigo*), has always been justly looked upon as very dangerous. The holy scriptures speak of it as an effect of the wrath of God. Pliny reckons it more hurtful than hail; and therefore it was, says he, that Numa Pompilius instituted festivals, called *Rubigalis Festa*, to avert the effects of it. They were celebrated in the month of April, because this distemper usually begun in that month. The nature of it is not yet well understood. It generally begins when, in hot weather, there has fallen a plentiful dew, which was supposed to break the vessels of the leaves and stems of plants, from whence issued a thick extravasated juice, which, being dried by the sun, was turned into a red powder which adhered to the plants, and did them great injury; for they soon after appeared gangrened, if we may apply this word to plants. Count Francesco Ginnani, in his work intituled *Delle Mallatie del Grano in Herba*, C. 5. Part. II. attributes this distemper in vegetables, not to the extravasation of their juices, but to the hatching of the eggs of insects. He has seen them, he says, between the outward and the inward covering of the leaves. Plenciz, in the work before-mentioned, quotes the microscopical discoveries of Need-

* Several other fatal effects which arise to men and beasts from their feeding on distempered corn, or distempered grass, are frequently noticed in Mills's *System of Husbandry*. The above fact in particular is related in Vol. II. p. 407. of that work, with the addition of some farther Observations thereon made by our illustrious Royal Society.

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ham, the Observations of Mercurialis, and the Acta Eruditorum of Leipzick for the year 1718, in order to demonstrate that what is properly called *the Rust*, depends on the eggs of certain vermin, which, being laid on vegetables, penetrate the outer skin, hatch, and afterwards multiply there. Calm and temperate weather, rather warm, and in which there are dripping rains without a cloudy sky, favours their production. This, says he, is what was experienced in Austria in the year 1751, and what was observed on the 31st of March and 30th of June 1759, on both which days it did not cease to rain, though the sky was clear. In the former of these cases, almost all the vegetables in the country were covered with rust; and in 1759 the wheat was greatly damaged by it. This opinion of the cause of this distemper is adopted by M. Tillet, by Löwenhöeck in his 109th letter to Van Leeween, and by M. Duhamel. Whatever be the case as to this opinion, all agree that damaged or corrupted food must be as hurtful to other animals as to men. Clover, sainfoin, and lucerne are certainly wholesome plants; but let them be attacked with this distemper, they become as hurtful as the crow-foot (*ranunculus*), tithymal (spurge), or hellebore; and these too, dangerous in themselves, become more so when thus affected. This rust, says Ramazzini in his Observations on the Epidemic Distemper at Modena, seems as corrosive as spirit of nitre. The pastures corrupted by it were so fatal to cattle, that whole herds were carried off. In 1693, the grass was infected by it in Hesse, and accordingly, says Bernard Valentine, the cattle died there by whole droves. The same happened in Carniola in 1712, and in the Ferrarese in 1715; and the same consequences ensued. Rye which has the spur is not only fatal to men,

but

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but occasions internal and external ulcers in hogs and geese.

In the months of July and August, 1756, there was a mortality amongst the cattle in Minorca, which having been transported thither, could not bear the heat of the climate, as was mentioned before. The herdsmen who attended them fell sick; but the disease was much more severe in those who had been so imprudent as to eat of the flesh of the sick cattle; for all of them were seized with a malignant fever, accompanied with a gangrene which shewed itself on the second day, especially at the elbow and heel.

The rust is to grass, what a corrupted state is to flesh: If flesh in this state occasions fevers amongst men, why should not vitiated plants have a similar effect on cattle? Independent of this, there are plants which are in themselves prejudicial to cattle. We see them frequently die in marshy ground, whilst those fed on the neighbouring heights are healthy. In our pastures, hurtful plants grow among the good, and the care of selecting the latter is left to the cattle. It is true that the Creator has indued them with an instinct to distinguish the hurtful from the good; but the former often grow so close to the latter, that it is almost impossible for them to crop the one without eating of the other. We see the crow-foot growing every where: All the species of it contain an acrid juice, especially the parsley-leaved marsh crowfoot, *ranunculus palustris apii folio*, otherwise called *herba scelerata*, a name which sufficiently indicates its noxious quality. This grows by the sides of rivers, and is indeed not so often met with as the acrid upright meadow crowfoot, *ranunculus pratensis erectus acris foliis*, and the creeping hairy meadow crowfoot, *ranunculus pratensis repens hirsutus*, which are very

common in our meadows, and though less dangerous to cattle, yet are injurious to such as eat them. The *ptarmica vulgaris*, *dracunculus pratensis*, which some likewise call the sneezing-plant, is not less common nor less acrid than the *ranunculus*. We also find in them the spurge (*tithymalus*), a very acrid plant, the small kind of hemlock, and the mille-foil, which ought to be banished from them. A careful observer will remark other plants perhaps equally prejudicial; and the husbandman who suffers such plants to grow in his pastures is inexcusable: for when one or two of the creatures fed on them become sick, the disease soon communicates itself to many, already pre-disposed, by the effects of their food, to receive the infection; and thus it is insensibly spread.

Water, which should be accounted an aliment, may, by bad qualities communicated to it, contribute greatly to the production of epidemic diseases; and still more so, when assisted by distempered or acrid food.

We read in the Philosophical Transactions, that, during the plague in London, there was collected from off the surface of water exposed in a vessel to the air, a blue pellicle, which having been mixed with bread, and given to a dog, killed him in twenty-four hours. But without being infected by these pestilential particles which drop upon it from the atmosphere in a pestilential constitution of the air, the water may be charged with other substances pernicious to animals, taken up whilst passing through mines of lead, copper, &c. It sometimes carries with it gypsous matters and selenites, which may form concretions or obstructions, and cause many diseases. The waters in Minorca are of this kind: having too short a run to drop the earthy particles

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cles with which they are loaded, they constantly form strong concretions adhering to the sides of the vessels in which they are contained. Standing, heavy, slimy water, loaded with many insects and their eggs, as well as with many particles from the animals and vegetables which die and rot in them, is the cause of many diseases to cattle which are often obliged to drink of it. Water is both the most universal dissolvent, and the aptest vehicle for carrying noxious particles into the blood.

Standing putrid water is not more pernicious by reason of its viscidty, than it perhaps is on account of vast numbers of small worms which are swallowed along with it, and live and grow in the stomachs of cattle; as do also their young brood. These by their motion irritate, and by pricking inflame the stomach and intestines, from whence proceed spasms and convulsions, somewhat similar to what arises from the use of acrid or distempered food: for these too irritate the stomach and intestines, and the ill effect that will follow is an acceleration of the peristaltic motion of the intestines; whence more frequent discharges, and even bloody flux. The acrimony, being sometimes so strong as to erode the coats of the stomach and intestines, occasions inflammations and intolerable pain, convulsions, &c. and the inspection of the dead bodies shews us, that, in contagious diseases, the stomach has been inflamed, and that the internal coats, by the livid spots in them, which are sometimes continued down the whole length of the intestines, had a tendency to a mortification or gangrene.

Of the Cure of the contagious Diseases of Cattle.

IT has been already said, that the constitution of the air is one of the general causes of contagious diseases among cattle. M. Le Clerc, treating of the epidemic diseases which desolated Russia, lays down the following rules for judging of the nature of contagious diseases, and of the method by which they may most probably be cured. "An unexpected distemper," says he, supposing the case, "breaks out at once with alarming symptoms and terrible effects, and communicates itself from creature to creature. The effects of this distemper, howsoever complicated they may be, teach me the time, the order, and the means of correcting an evil arising from a cause unknown. Nature also shews me, by the crisis she brings on, the manner in which the disorder should be expelled. Moreover, I attentively consider the qualities of the air we breathe, the situation of the place, the qualities of the soil, the kind of life which the inhabitants lead, the disorders which at the same time affect cattle or plants, the neighbourhood of mines, marshes, standing water; and if I do not trace the cause in any of these, I look back, and search for it in things already past. I reflect on the seasons anterior to the disorders: I examine the time, the course, the duration, the anticipation, the changes, the temperature, and finally the mixt or extraordinary qualities of the seasons, and the winds which have been most frequent during that time. I then reflect on the nature of the diseases which these variations have given rise to; nor do I lose sight of the changes these diseases have undergone. If in my researches I at length find one or more causes
 "capable

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“ capable of producing the disorder which I
 “ was unacquainted with, I compare the effects
 “ of the distemper with the power of the cause,
 “ and then draw my conclusion from their re-
 “ semblance, or analogy. Have southerly winds
 “ reigned long? I answer, that these winds are
 “ naturally pestilential: they may therefore pro-
 “ duce pestilential fevers. Do the mixed or ex-
 “ traordinary qualities of the seasons, their heat
 “ and moisture united, occasion the distemper?
 “ The effects, being truly discovered, make
 “ known the state of the fluids and solids during
 “ and even after, such a constitution of the air.
 “ The disorder being known, (as far as our li-
 “ mited knowledge can reach) I form my indi-
 “ cation of cure. I guard the infected body
 “ against the effect of the present venom, by
 “ giving, of choice, such medicines as have been
 “ employed with the greatest success in such dis-
 “ eases as have been particularly marked by simi-
 “ lar effects. These are the means of coming
 “ at the knowledge of venom; a knowledge
 “ which is not otherwise sufficiently manifested
 “ to our senses. Does the intemperature of a
 “ season give me room to think that it is the
 “ efficient cause of any disorder? I have im-
 “ mediate recourse to the hydroscope and engyscope.
 “ The first informs of the real state of the air;
 “ the second gives me an insight into the nature
 “ of the particular salts then diffused in the at-
 “ mosphere*. I then expose to the air every
 “ substance which the salts of the air can alter,
 “ as silks died of such particular colours as are
 “ tarnished by the nitrous or sulphurous acid,
 “ and are turned black by the vitriolic acid. I

* The curious may likewise consult on this subject, *Les*
Experiences Phys. de Poliniere, Tom. II. p. 306, & seq.

“ moreover observe the alterations which the vapours of dew have produced on white linnen before it has been washed with ley or soap.”

In all the cattle which have died of contagious diseases, and have been opened, there have been evident marks of inflammation and putrefaction. These distempers may therefore be reduced to the putrid and the inflammatory kinds. Putrid diseases differ among themselves, as do likewise the inflammatory: but that difference consists only in the greater or less degree. The epidemic distemper of 1690 shewed itself with pustules. Whenever eruptions appear on the skin, it is a certain proof that the cutaneous vessels are obstructed with a matter that cannot circulate in so minute vessels, and therefore an inflammation arises. In almost every creature that was opened in 1693, there was found in the lungs a suppuration, which must have been preceded by an inflammation. The distemper which proved so fatal to the cattle in Lower Hungary in the year 1712, appeared with pustules which contained an extremely foetid matter. The stench of that matter, and of the humour which flowed from the mouth and nose, proved that a putrefaction was joined to the inflammation in that disease. The author who has described the epidemical constitution at Augsburg, declares the distemper of the cattle was putrid and inflammatory. In the contagious distemper which prevailed in 1740 and the following years, the fever appeared to be inflammatory, malignant, and putrid. The contents of the first stomach were very putrid, and the air which proceeded from it was extremely foetid: those of the second looked as if they had been dried: it's membranes were black, gangrened, and easily torn to pieces; as were also the membranes of the third stomach and of the

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the intestines, which likewise contained sometimes purulent matter. Black spots and hydatides were observed on the liver, the lungs, and on the meninges of the brain. In the cattle which were opened in Minorca in 1756, traces of inflammation, terminating in mortification, were observed in almost all the bowels. The appearance of the sheep which died of the small-pox in the neighbourhood of Beauvais, likewise confirms that the disorder was highly inflammatory and putrid.

As it has constantly appeared upon opening the bodies of cattle which died of contagious distempers, that the diseases were either inflammatory or putrid, the method in which these disorders should be treated is hereby pointed out. When they are inflammatory, the first intention should be to cool the too-great heat of the blood, to lessen it's rarefaction, the velocity and force of it's motion, in order to take off or lessen the obstructions in the capillary vessels. These purposes are answered by plentiful bleedings, by so much the more necessary in cattle, as the action of their vessels is stronger than in men. The heat and strong action of the vessels soon dissipate the thinnest watery part of the blood, whence farther obstructions ensue; and hence it is that inflammatory diseases are most dangerous in the most healthy constitutions, and in the most robust animals. Evacuations become therefore the more necessary, lest suppurations or mortifications should be the consequence. Plenty of cooling and diluting liquors should be given at the same time.

If, on the contrary, signs of putrefaction appear, the first passages should be immediately cleared of whatever putrid substance they contain, or of any substance that may become so;
for

for if they were to remain there, they would communicate their putrid taint to the blood. This end is obtained by glysters and purging medicines. The first passages being thus cleared, digestion is better performed, and room is made for antiseptic medicines, which may destroy the remaining infectious venom.

Comparative anatomy teaches us, that the structure of other animals differs but little from ours. The animal and vital functions are the same; the secretions are made in the same manner. Why then should not the same medicines be used in their disorders as are used in ours?

In case a contagious epidemic distemper amongst cattle is attended with a cutaneous eruption, it will be first of all necessary to examine what kind of eruption it is: for cutaneous eruptions proceed sometimes from the violence of the fever, from acrid and stimulating substances taken down into the stomach, or from medicines of too warm and cordial a nature. In this case, no good is to be expected from the eruption. But sometimes it is an effect of nature to relieve herself by throwing the peccant matter out upon the skin; and in this case the eruption is favourable, and should be encouraged.

In the first case, the fever is high, the heat considerable, and all the signs of inflammation appear. Recourse must therefore be immediately had to bleeding, and to cooling and diluting liquors, such as water in which salt-petre or sal-prunel has been dissolved; an ounce in about fifteen pounds (or pints) of water. In lieu of salt-petre, vinegar or spirit of vitriol may be mixed with water in quantity sufficient to give it a grateful acidity. The food should be light; such as fresh grass or other plants, and bran boiled in water. By these means the progress
of

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of the inflammation may be stopped, or a resolution may be obtained of the vessels already obstructed.

In the latter case, the above method must be avoided: evacuations might strike in the eruption, and thereby prove mortal. The eruption must, on the contrary, be encouraged, by giving an ounce of theriac to a bullock or a horse. The eruption will likewise be kept up by giving them daily a spoonful of the flower of sulphur with bran. Their drink should be water in which sea-salt has been dissolved. That salt is a diuretic which helps to depurate the blood by urine. The depuration should be aided by a seton made in the dew-lap of a bullock, by piercing it thro' with a bistory, and drawing through the incision a rag of linnen or a skeine of thread, daubed with basilicon. Care must be taken to draw the rag or skeine through the wound daily, so as to leave a fresh piece of it in the incision, in order to keep it clean. If, notwithstanding these means, the eruption does not keep out, the dose of theriac must be repeated, and a decoction of sarsaparilla and saffrafras, or of contrayerva, must be given for drink.

The contagious distemper which appeared in Hesse in 1693 terminated in a pulmonary phthisis, which might have been prevented, or rendered milder, by bleeding in the beginning, and by cooling and nitrous or acidulated drinks. If it could not be entirely prevented, it might have been very proper to have given to the sick animals half an ounce of sulphur, and the same quantity of cinnabar of antimony mixed with bran; at the same time rubbing them heartily and often, in order to determine to the pores of the skin the matter which would have produced an abscess in the lungs. When the small-pox
does

does not suppurate kindly, the disease often falls on the lungs; and by the rule of contraries, a cutaneous eruption, a determination of the humours towards the skin, often draws the humour from the lungs, as is frequently seen. An ulcer, an issue, make drains which often relieve the lungs. The phthisis might therefore have been thus prevented, seeing it proceeded from the same cause which three years before brought on the small-pox. This is making nature our guide.

The contagious distemper which reigned in France and over all Europe from 1740 to 1750, and which had appeared before in Hungary, Germany, and Italy in 1711 and 1712, shewed itself with evident symptoms of an inflammatory, malignant, putrid fever. As the throat, stomach, and intestines were greatly irritated by an extremely acrid humour, the first care, in such a case, should be to allay the acrimony by mild drinks which resist putrefaction, and to prevent the inflammation it may cause, by bleeding. With this view, a glass of oil of olives, or of linseed oil, with half as much vinegar, should be given morning and evening in a pint of warm water. During the two first days, a decoction of sorrel rendered gratefully acid with vinegar, or spirit of vitriol, should be given, and for food only bran boiled in water, in order to give time to the stomachs to free themselves of the food lodged in them, as was before observed; after which it will be right to give them an ounce of crocus metallorum in powder, or, which is yet better, the ounce of crocus may be infused for twenty-four hours in a quart of white wine, and the whole be given at once through a horn. A quart is the dose for horses, bullocks, and cows, and half a pint for sheep. The creatures which take this remedy should be kept all the day warm

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warm in a stable, and not be suffered to eat till the evening; the effect of this medicine being as much by the skin as by purging. The efficacy of this medicine has been often experienced; yet the violence of the distemper requires that we do not stop here. The seton before recommended is here of the greatest utility. If people in the country cannot procure the *crocus metallorum*, they may substitute in it's place two ounces of dry briony roots, or one ounce and a half of those of asarabacca. The *crocus metallorum* is however by much the best. In order to cause a freer discharge from the mouth and nose, powder of hellebore, or of horse-chestnut, may be blown up the nose, and the mouth may be washed with a mixture of vinegar and theriac: or if the nose is dry, it may be proper to throw up into it, with a syringe, some barley-water and honey; and if a stimulant is wanted, some flower of mustard may be added.

If, notwithstanding this treatment, the symptoms do not abate, recourse must be had to the Peruvian bark, half an ounce of which, mixed with two drams of salprunel and twenty grains of camphire, should be given night and morning. These medicines are powerful preservatives from putrefaction, especially the bark, the virtue of which in gangrenes is well known. Country people, who cannot afford the expence of these medicines, may substitute in their place half an ounce of gentian-root with half an ounce of kitchen foot, this abounding most in sal ammoniac. The salpernel and camphire may be added to them, because these medicines powerfully promote the secretions by the skin and kidneys. Instead of the theriacated vinegar, one may use strong vinegar, in which a handful of salt has been dissolved, and a few heads of garlic bruised. It is proper

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proper to observe that, if the animal has not been bled in the beginning of the disorder, bleeding should not be attempted now; for it will do much hurt.

When hard tumours or buboes appear on the breast, or groin, as happened in the contagious distemper in Germany which succeeded to that in Hungary, cupping-glasses are thought to be of great use, to draw the humours the more to these parts. They should also be scarrified, and brought to suppuration as soon as possible by applying warm ointments and poultices; and to determine the remaining peccant matter to the pores of the skin, half an ounce of foot should be given daily in a glass of theriacated vinegar. A buboe in the glands about the throat and neck has often proved a happy crisis, and carried off pestilential fevers. The theriacated vinegar consists of two ounces of theriac dissolved in a quart of common strong vinegar. The strongest is the best.

If a red blister, turning black at the bottom, is perceived on the tongue of an animal, such as was observed in the years 1731 and 1765, that blister is much to be feared. It is a pestilential pustule which may carry the creature off in twenty-four hours; and therefore the cure must be very speedy. The whole of this blister should be immediately cut out, and carefully separated from the live flesh. The skin and every part which appears black should be taken away, and the wound be afterwards washed three times a day, at least, with strong vinegar in which some salt has been dissolved; and this should be continued till the wound is cicatrised.

The Royal Society of Agriculture at Paris have published the following method, which was found successful in the generality of Moulins, where

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where it was tried on three hundred and thirty horned cattle, all of which were cured.

“ The first care was to administer preservatives to the sound cattle. To this end they were bled in the jugular, their mouths were washed frequently, acidulated nitrous drinks were given them, and their habitations were fumigated.

“ The lotion was made of vinegar, pepper, salt, and assa-foetida bruised. The whole was mixed together, and steeped, shaking it at different times. The tongue and all the parts of the mouth and jaws, were then strongly rubbed with this liquor. Every part of the tongue was in an especial manner rubbed with a cloth wet in the liquor. Sometimes half an ounce of sal ammoniac was added to this lotion.

“ The drink was barley-water, with an ounce of salt-petre, and vinegar enough to render it gratefully acid.

“ The fumigation consisted either of vinegar thrown upon live coals in the stable or cow-house; or of four handfuls of juniper-berries, two of wormwood, two of elicampagne-root, and two of leaves of sabine, with an ounce of myrrh; the whole powdered and burnt on a chafing-dish.

“ Likewise, juniper-berries were steeped in vinegar, and a handful of them mixed with bran was given twice a day.

“ In places where the contagion had been extremely violent, the drink prescribed consisted of two handfuls of rhue infused in a pint of red wine; to which were added a few cloves of garlic, some juniper-berries, and two drams of camphire. A horn-ful of this was given every morning to each creature, fasting; and by the use of all these means, two hundred and twenty-five bullocks and cows were preserved from all taint, though

though several of them had communication with the sick animals.

“ With regard to the treatment of these last, all bleeding was forbid; the fumigations were recommended; and as to the tumour which appeared on the tongue, it was thought better and surer to cut it intirely out with a bistory or scissars, than only to scrape and rub it. Scarifications were ordered to be made in the bottom and sides of the ulcer, and the whole tongue was afterwards fomented five or six times a day with tincture of myrrh and aloes, or with spirit of wine in which sal ammoniac and camphire had been dissolved, in the proportion of half an ounce of each to eight ounces of the spirit. A wash of theriacated vinegar, with some camphire added to it, is likewise very proper in this case; and it will not be at all amiss to make the creature swallow a spoonful or two of it every time it is used: for it cannot be thought that a distemper, of which the effects are so rapid and severe, that the tongue of the animals may be cut asunder by it and drop off in less than twenty-four hours, can be sufficiently treated by external remedies only. The following alexiteric medicines are therefore advised to be given inwardly.

“ Take roots of contrayerva and elicampane of each three drams, a dry viper in powder, and one dram of camphire; mix them with a sufficient quantity of the extract of juniper, make them into a ball, and give it to the animal.

“ Or, take of the root of swallow-wort, of master-wort, of elicampane, and of angelica, of each half an ounce; boil them in two pounds (or pints) of vinegar of roses till one third of it is evaporated. Strain off the liquor, and then add to it one ounce of orvietan: then divide it into two doses, and give one of them in the morning fasting,

fasting, and the other in the evening, taking care to cover the sick creatures well whilst they are taking the medicine. This done, there will be no need to fear returns of the disorder, sometimes by so much the more fatal, as it afterwards appears on other parts, and in a different form; as experience has shewn. It is moreover necessary that the diseased be perfectly cured, that both sound and sick be well curried, and that their mouths be examined several times a day to be assured of the situation the beast is in; for this gangrene does not shew itself by any other external sign."

The small-pox is, next to the plague, the most dangerous of all the contagious diseases to which sheep are liable. I shall here distinguish it only into the distinct and the confluent kinds. The distinct, or mild, stands very little in need of medicines: it may, and indeed should, be left to nature. The confluent, on the other hand, requires the greatest attention. Whatever the cause of this disease may be, we look upon the expulsion of the matter, and the suppuration and drying of the pustules, as the natural progress of it. There must then be an eruption: but sometimes the eruption is imperfect, comes on with difficulty, or is even suppressed; and at other times it is so great as to endanger the life of the animal. It therefore is plain that this disease should not always be treated in the same manner; for sometimes cordials may be requisite in order to support a too-feeble eruption, and cooling medicines may be necessary to check a too-high inflammatory fever. If therefore, the fever appears high, blood must be taken from the jugular, and this must be repeated, because not above two or three ounces can be got from the jugular of a sheep at one time. This operation

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tion was found to give great relief to the sheep before spoken of at Beauvais. It sometimes lessens the number of pimples; but those which remain become larger, and suppurate more kindly. Two drams of salt-petre mixed with honey are given every day to each sick animal, and for drink warm water rendered gratefully acid with vinegar or spirit of vitriol; nor should the seton be forgotten here. If the pimples are of a violet or purple colour, they indicate a gangrene, or at least a disposition towards it. In this case, a dram of Peruvian bark, half a dram of sal-prunel, and eight grains of camphire, mixed up with honey, should be given two or three times a day. Some sheep thus affected, and which had been given up as lost, were recovered by the use of these medicines. They must be kept within-doors, especially in the winter.

If the sheep are weak, and the eruption feeble, not only bleeding should be avoided, but such medicines should be given as will incline the matter to the pores of the skin; such, for example, as a dram of vipers in powder in a decoction of contrayerva-root. A blister may be put on the neck after clearing it intirely of wool. This blister should be made of cantharides and a little vinegar mixed with leaven. It is commonly left on for a long while, because the flies do not easily affect the skin of sheep. One might even use from time to time a decoction of the sudorific woods; for the common drink of the sheep in this condition should be water in which sea-salt has been dissolved.

When the pimples appear again, the eruption is kept up by giving every day half an ounce of flower of brimstone with as much laurel-berries in powder, mixed with bran. This should be continued till the pimples begin to suppurate;
after

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after which the sulphur and laurel-berries should be suppressed, but their drink should still continue to be water rendered diuretic by the mixture of sea-salt. The discharge from the nose should be encouraged, by washing the nose with a decoction of tobacco and blowing up the nostrils hellebore and betony in powder: for though a great discharge from the nose is a bad symptom, as it always indicates much putrefaction; yet a free discharge from thence is beneficial, just as a plentiful spitting is to mankind.

As soon as the pimples become dry, it is highly proper to purge the sheep with half an ounce of assafoetida in powder mixed with bran, to prevent a translocation of matter on the eyes or breast, which otherwise happens frequently.

In a village called les Echerres, about three leagues from Lyons, one half of a flock of sheep was seized with the small-pox: the sound half was immediately separated from the infected; but though all communication between them was cut off, the disease broke out in some of those which had been deemed sound, and those infected ones were returned back to the sick. Endeavours were used to ward off the infection by properly fumigating the sheep-cotes, and clearing them of every ordure or other thing that could communicate or continue the infection.

Blisters were immediately applied to the inside of the thighs of most of the infected sheep; whether the small-pox was of the distinct or of the confluent kind; and in the others, instead of the blister, a seton was cut. The suppuration was soon established by the one and the other of these means, and the effects which they produced were sensibly advantageous. The former of these creatures were not left wholly to nature; but she was assisted when necessary by decoctions of juniper-

berries, or by decoctions of saffron in the proportion of a quarter of an ounce to a pound of water: and these remedies were given through a horn. In the confluent kind, recourse was had to the Peruvian bark, which is known to prevent and even to cure gangrenes. It is a medicine which promotes a favourable suppuration. Half an ounce of roots of swallow-wort was boiled in a pound of water; and in the strained liquor was put a dram of Peruvian bark in powder; it was then boiled up again, and the sediment was given with a horn every morning and evening: by way of precaution, ten grains of salt of wormwood were added to each draught, in order to give the more activity to the bark.

Camphire was tried on other sheep which had the confluent small-pox. Thirty grains of it were rubbed into the yolk of an egg, then mixed with a dose of the foregoing decoction, and given with a horn morning and evening.

When the disease fell on the eyes, the following collyrium was used.

Take two handfuls of quince-leaves, two drams of rind of pomegranate, one dram of seeds of sumach; infuse them for some hours in a pound of warm water. then give it a slight boiling, filtre it, and, after having added to eight ounces of this decoction two grains of camphire and eight grains of saffron, foment the eyes of the creature with it.

Emollient glysters were given occasionally, and purges towards the close of the disease. This practice was attended with so much success, that out of twenty-two sheep which were seized with the disorder, only one died.

M. Haister treats this disease in a manner very different from the above related. He attributes it to a too-great quantity of humours, and prescribes
only

only dry, sweating medicines, salt, lovage, rupatorium, some grains of civet, and all in a dry form: and, what is still more, he forbids giving any drink to the sheep whilst they are sick. This method may succeed in Sweden, a cold country, in which the perspiration is but little, the plants more watery, and the blood more serous: but surely such treatment would not answer in Languedoc, Provence, or any other warm climate, where the food is drier, and carries less moisture into the blood. Regard should always be had to the country and climate, in the treatment of every disorder, whether epidemic or other. The situation of Naples, bordering on the sea, in the neighbourhood of a vulcano, in a country which abounds with sulphur; that of Rome, in a champaign country, washed by a river whose waters, having but little descent, move slowly; are very different from that of Paris or Lyons, cities more inland, and in a colder climate. This difference in situation and climate must occasion a difference in the nature of diseases, and consequently should do the same in the method of treating them.

It is not less necessary to know how to guard against the contagious distempers of cattle, than it is to be acquainted with their natures, and a successful method of cure. To prevent a contagious distemper, the creatures exposed to it must be preserved from the influence of the cause, or the cause itself should be corrected. When the contagion is the effect of the constitution of the atmosphere, it is very difficult to preserve animals from its influence; for being continually exposed to its immediate contact, they breathe it, it enters with the food into the stomach and intestines, it penetrates into the substance of the lungs, and in each of these places

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it communicates it's noxious quality. It has, however, been found by experiment, that the constitution of the air may be changed for the better. We are told of what advantage the fires which Hippocrates ordered to be made were in the plague. Levinus Lemnius (*Lib. II. de occult. Nat. Mirac. cap. 10.*) says, that the garrison of Tournai kept the plague off from that city by firing so many cannons, and burning so much gun-powder, that the air was totally changed thereby, and the city preserved from that dreadful scourge. In fact, nothing is fitter to correct the bad qualities of a putrid air, than that excellent antiseptic, the sulphurous and nitrous acid set at liberty by the deflagration of gun-powder. It would therefore be adviseable to burn sulphur and nitre in the buildings where the animals are lodged, or to cause vinegar to be boiled in them till it is totally evaporated. Juniper-berries, myrrh, olibanum, assa-fœtida, may also be burnt in them; but these last fumigations should be used only in the winter, nor are they at any time so efficacious as the acids. The habitations of the cattle should be kept as clean as possible, their walls should be white-washed, or washed with vinegar, the litter in them should be frequently renewed, their doors or windows on the north-side should be opened, and those on the side from whence the infectious air proceeds, should be kept shut, as advised by Varro.

The bad effects of air may also be prevented as follows. If the constitution of the air tends to produce inflammatory diseases, it is proper to bleed the creatures exposed to it, to give them from time to time acidulated drinks, to prevent their being exposed to great heats, not to put them to hard labour, to take care that they do not pass suddenly from a hot to a cold place,
and

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and that they do not drink too-cold water when they are heated. If, on the contrary, the constitution tends to produce putrid diseases, it would be proper to purge them with crocus metallorum, or assa-fœtida, or roots of briony, or with assarabacca, to give them acidulated antiseptic drinks, and to rub them often, as well to free them from infectious particles which may adhere to the hair, and penetrate the skin, as to increase the perspiration; for it is not to be conceived how many disorders arise from a suppression of perspiration, and how salutary it is to keep the perspiration clear.

When the contagious diseases of animals arise from the bad quality of their food, it is certainly in our power, in a great measure, to prevent them. All plants prejudicial to the health of cattle should be rooted out of every pasture; which is easily done with a spade, when the plants are in bloom; for if they are then cut through beneath the surface of the ground, and the clod is again replaced, the remaining root will perish and thus the whole pasture may in time be cleared of them. Artificial grasses may be sown instead of the natural. The world is now acquainted with the benefits which arise from such grasses, both in regard to their quantity and their quality. Lucerne, sainfoin, and clover, are known to be very wholesome and very nourishing. As they grow to a pretty good height, the effects of a mildew or blight may be prevented in them, which cannot be done in plants that creep along the surface of the ground. Thus it is a common practice, when corn is mildewed, for two men, holding each of them the end of a rope, and being as far asunder as the length of the rope will permit, to run along the fields of corn: the rope either shakes off the vermin which occasion the

blight, or makes the mildew fall off by the shaking of the corn, which afterwards recovers itself. If this method does not prove effectual when used on artificial grasses, the owner should not hesitate to cut down the pasture, burn what is infected, and endeavour to procure a fresh healthy growth. At all events, cattle should not be suffered to feed on infected grass of any kind, nor even in the field where that grass was, till a new growth has arisen.

Cattle should not be suffered to drink putrid standing water, especially in an infected season: for, as was before observed, the water which was exposed to the air during the plague of London, became covered with a blue pellicle, which, mixed with bread and given to a dog, made the creature die mad. Such a pellicle may adhere to all standing waters, and will be more or less dangerous, according as the air is more or less infected, and the water is more or less loaded with putrid substances.

As water is an indispensibly necessary article of food, every bad quality in it is the more dangerous, and the means of correcting them are the more requisite and valuable. In order to attain this desirable end, a very simple easy method was tried before the laudable Society for the Encouragement of Arts, &c. at London, with the wished-for success. It was found that clay mixed in putrid water, to such a degree as to take off the transparence of the water, so that a hand held under it's surface could not be seen through it, soon settles to the bottom, if suffered to stand still, and carries down with it all such vegetable or animal putrid substances as are mixed with the water. These substances, kept asunder, and buried as it were in the clay, cease to putrify,

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putrify, and the water remains perfectly clear for a long time. It is almost needless to observe, that if there are any living insects in the water, they should be separated from it, by running the water through something which shall keep back those insects, or their brood, which may be too bulky to be carried down and buried in the clay. If the putrefaction be great before these means are used, a disagreeable stench may still attend the water, though it appear clear. The reverend Dr. Hales, that friend of mankind, has taught us to get rid of this by ventilating the water, that is, by forcing through it air, which carries off the remaining putrid taint. If any object to the trouble of preparing in this manner a sufficiency of water for a whole herd of cattle; all the answer that such deserve is, that if they think the health of men and of beasts not worth this trouble, it is in their power, they and their cattle, to crawl slowly, but certainly, to the grave. Even amongst mankind, many of the usual autumnal epidemic diseases might be prevented by this easy method: for the bad water which is drank at that season gives rise to many disorders in the bowels, as well as to fevers of various kinds.

If clay cannot be had, it is adviseable to shake the water well, or have it tossed about by oars, before it is given as drink. Thus it is that people on board of ship render their corrupted water less unhealthy by beating it; by which means the impurities in it fall to the bottom of the casks. Mr. Boyle, having taken some water which had gone a long voyage, beat it frequently; by which means all it's impurities subsided, and it became perfectly pure and wholesome.

Where

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Where sweet water is wanting, a well should be dug *.

If a contagious disease has unhappily seized a herd or flock, every means possible should be used to prevent it's spreading. The first care to be taken is, to cut off all communication between the sound and the sick. Cattle collect the grass with their tongue, before they bite it; by that means some of their saliva necessarily adheres to the grass which remains, and if they are distempered, the grass is of course infected; and other cattle which feed on it catch the contagion. Again, cattle are fond of licking one another; and as their tongues are rough, there sticks to them a great deal of hair, which afterwards forms in their stomachs balls, called *egagropiles*, which incommode them much when they become of a considerable size: but this is not yet the greatest evil. The perspiration is vitiated in infected animals, and their hair falls off easily: the infection adhering to the hair thus licked off by a sound animal, becomes an infection to this last, and thus it may be spread to many. The herds should therefore be frequently visited, in order that every creature of which there is the least suspicion may be separated from the sound, which last must no longer feed on the same pasture, nor drink of the same water, with the former; even the cribs, trays, tubs, or any other thing made use of for the sick, must not be brought near the sound, at least till they have been well washed with lime-water or vinegar, and afterwards fumigated. The persons who at-

* The means of knowing where water lies under any ground, how accordingly to come at it, and how best to preserve it in ponds, particularly for the use of cattle, are amply pointed out in Vol. III. p. 385—390. of *Mills's System of Husbandry*.

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tend the sick cattle should not approach the sound ones before they have washed themselves, and changed their garments, which, in this case, should be of flax or hemp, and not of woollen; because wool imbibes the contagion, retains it, and readily communicates it.

On the above principle it was that Lancisi proposed to a congregation of Cardinals, during the afore-mentioned plague which made such havock in Italy, to kill not only all the cattle that were manifestly infected, but even all those that there was but the least room to suspect of being infected. This advice was rejected after a long debate, and it was too soon experienced how much wiser and more prudent it would have been to follow it. A proof of this soon resulted from the town of Capravola. Five bullocks there were suddenly seized with the distemper; and after immediate strict inquiry it was found, that a strange bullock had been introduced into the inclosure where all the cattle belonging to the town were kept. The infected bullocks were immediately killed, and the distemper ended there.

All those who took sufficient care to prevent the entrance of any infected creature into their lands, not only about Rome and the Ecclesiastical State, but also in the territories of other princes, preserved their cattle. Such was the effect of the vigilance of the Princes Pamphili and Borghese, that, though at the very gates of Rome, and in the province the most infected, all their cattle escaped unhurt. The same care preserved the fields of Corneto, of the Patrimony of St. Peter, of Umbria, of Picenum, of the Flaminian province, of Tuscany, and of Modena: and it is likewise by the same means that the
convents

convents of nuns are generally preserved from the plague, when it unhappily attacks mankind (a). By a similar care the Temple was preserved from the plague, when it made such havoc in London, in 1666.

Too much care cannot be taken that the bodies of creatures which have died of contagious diseases be buried deep, especially in warm and moist countries; not only to prevent carnivorous animals from being infected, which may soon spread the contagion, but also to avoid increasing the putrid exhalations with which the air is already too much loaded. They were very near being fatal to the French in Minorca. That island being a rock covered with very little earth, it was not possible to bury the bullocks which died; they were thrown into the harbour, with heavy weights tied to them: but notwithstanding this precaution, the bodies soon rose up and floated on the surface of the water, which is constantly the case as soon as an incipient putrefaction sets the fixed air in the animals at liberty, and the bodies become specifically lighter than the water. These bullocks infected the air of the port with a horrible stench, which rendered sick many of the seamen who remained on board of the ships; and though the carcases were towed out into the open sea, yet as the current brought them frequently back, it was found that the only safe way was to burn them.

Reflecting men observed, with much concern, that, during the contagious distemper which prevailed from 1740 to 1750, the country people, in France in particular, took very little care to prevent the spreading of the contagion. They

(a) See *Lancisi Opera*, Tom. II. Gen. 1713. *Dissert. Hist. de Bovillâ peste.*

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skinned their dead cattle, and kept the skins; an œconomy fatal to the surviving cattle, and ruinous to their owners. None should be permitted to keep such skins, unless they are immediately put into lime-water, and steeped in it for some time. The dung of diseased cattle does not require less attention, because the infection is quickly communicated by it when it is left exposed to the air. Every particle belonging to infected creatures should therefore be immediately burnt, or buried very deep.

When one is obliged to make use of a building in which creatures infected had formerly been, too much care cannot be taken to clean the floor, walls, roof, and every other thing belonging to it, and also to sweeten the air: for it has been observed, that healthy creatures have been seized with contagious diseases by being put into buildings in which infected animals had been, even though those buildings had not been used for a considerable time. Trincavel relates (*Lib. III. Consil. 17.*), that ropes, which had been made use of to carry out dead bodies in time of a plague, being taken out of a trunk in which they had lain twenty years, by a servant, he and ten thousand more died of the plague. Sennert (*Tom. II. p. 150.*) mentions a plague at Breslau, which was communicated in 1553, by linnen that had been locked up ever since 1542. Since then the contagious virus will remain so long dormant, and yet retain all it's strength, too much care surely cannot be taken to purify the buildings into which cattle are to be put. It is not enough to clean them and keep the doors and windows open: every part of them should be well washed with lime-water or vinegar, fumigations should be burnt in them, and
vinegar,

vinegar, or spirit of nitre, should be boiled in them till totally evaporated.

By strictly attending to the above precautions, we may hope to prevent many contagious distempers, to hinder their spreading, and even to cure, by means of the few medicines here mentioned, considerable numbers of infected cattle.

Additional Observations on the Diseases of Cattle, and on their Cures; by the Royal Society of Agriculture at Paris.

TOWARDS the end of the year 1762, a formidable disease attacked the cattle in the parish of Mezieux in the province of Dauphiny. The bullocks and cows were chiefly affected by it: but few horses or mules felt it.

During the first twenty-four hours the following symptoms appeared. A refusal of all kinds of food whether solid or even liquid, a heaviness of the head, hanging of the ears, watery eyes, rough and dull-looking hair, a costiveness not to be got the better of, a painful swelling about the lower jaw and along the neck, a pulse rather dull than frequent, a discharge of a frothy humour from the mouth and nose of some. These symptoms continued for two, three, or four days, at the end of which a great beating in the loins, and the feebleness of the sick creature, foretold a speedy and inevitable death.

The farriers and country people bled them in the ears, gave them cordials, and administered drinks with a view to purging, but which contained nothing capable of producing that effect. At length, the progress and ravages made by the disease determined the unhappy husbandman,

on

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on the point of being ruined, to apply elſewhere for the help of which he felt how much he ſtood in need. More intelligent perſons ſought in the dead bodies of the animals, that which the ignorant and uninformed could not diſcover in them. A beginning putrefaction ſhewed itſelf, by livid ſpots, in the hind part of the mouth, in all the muſcles of the pharynx and larynx (the gullet and windpipe), in the cellular membrane which ſurrounds them, in the whole paſſage of the æſophagus, and in the trachea arteria. In ſome bodies the cawl was affected, in others ſome of the inteſtines. In theſe laſt the ſpleen was greatly ſwelled; in the former, neither the liver nor the lungs were in a natural ſtate, and in all, the digeſtion was depraved, as it uſually is in all dangerous diſeaſes; for the paunch was filled with the food they had taken down before the diſorder had openly appeared in them. The red, and ſometimes brown or even black colour, the ſwelling, the ſoft conſiſtence of the parts about the throat in the greateſt number of the dead, were the conſequences of a violent inflammation, not of the eriſipelas or phlegmon-boil kind, for theſe would have excited a greater degree of fever, and would have ſhewed themſelves with a more remarkable pain and hardneſs; but of a latent inflammation, and a ſwelling cauſed by the want of action in the parts, ſuch, in ſhort, as is found in malignant diſeaſes. A ſimilar diſorder happened at the ſame time in the town of Macon, where a gangrenous quinfey carried off rapidly a prodigious number of people. This ſwelling frequently extended itſelf to all the glands of the lower jaw and about the neck and cheſt, thereby forming conſiderable tumours on the outſide, which in many creatures came to ſuppuration
either

either naturally or by the help of art. In some, the throat was not so dangerously affected; but tumours appeared in all parts of the body indiscriminately. These were not the less looked upon as critical deposits, and accidents which attended a disease owing to the same cause, and of the same character. In effect, the same treatment, except so far as the different deposits required a particular method of cure, preserved the lives of fifty-three out of sixty-two; whilst out of forty-nine which were treated in the common way, not one escaped.

The summer had been very hot, and the drought very great. The only pastures to which the cattle could be led were bordering on a pond full of muddy standing putrid water. The place nearest to this was a dry gravel heated by the scorching sun, and consequently a truly burning abode for the cattle, which were there most part of the day. Thus the excessive heat of the season, the indifference of the pasture, and chiefly the bad qualities of the water, were the first causes of this disease: for all the juices being heated and rarefied, there was necessarily a great loss of the most fluid and subtile parts of the blood, and the corrupted state of their food gave the disorder a putrid turn. The hind part of the mouth, the larynx and pharynx affording a continual passage to very hot air, and the mucus which should naturally moisten them being less, owing to the blood's being deprived of it, or to the excretory ducts being dried up, the whole became very susceptible of inflammation. Add to this the bad qualities of their food, and we shall not wonder that the inflammation degenerated into a quinsy truly gangrenous.

What in all similar fatal cases should be first attended to, became here the first object of our

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care. All communication was cut off between the sound and the sick: for the surest way to avoid the plague is to fly from it. The cattle which had hitherto escaped were therefore taken out of the infected houses, after having been strongly rubbed with wisps of straw previously fumigated with thyme, rosemary, sage, and other aromatic plants, on which a small quantity of vinegar was cast while they were burning. The buildings into which they were put were cleansed of whatever dung was in them, and fumigated with juniper and bay-berries bruised and steeped in wine-vinegar and burnt on live coals: others were fumigated with only the fumes of vinegar. The diseased cattle were afterwards carefully confined within the limits in which the disorder unhappily reigned; thereby to prevent it's spreading. The same precautions that were taken with regard to the sound cattle, were extended to all in general, to the extent of the boundaries of the village: all were bled again in the jugular vein, and by means of that evacuation, by rendering all their drink lightly acidulated, by diminishing the quantity of their food, by not sending them too soon to grass, by not suffering them to remain too long in the heat, and not to be out at all in the night; and lastly, by giving them sweet water to drink, above three hundred bullocks and cows were entirely preserved from this infection, which never went beyond the limits first set to it.

The sound cattle being thus taken care of, the infected were treated as follow: The buildings were cleaned and fumigated with the same care as for the others; the necessity of renewing the air became indispensable. The buildings were in general very injudiciously constructed, low and not airy. The constant respiration and perspiration

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tion of the animals that were in them soon deprived the air of it's vivifying principle, and those animal particles soon putrefied. From both these causes, the original tendency to putrefaction was much accelerated. Lofly buildings were therefore prepared for the sick, and they were kept well aired by windows which admitted a constant supply of fresh air at the same time that they carried off the bad.

The inexpressible advantages arising to mankind from that attention which the reverend Dr. Hales excited to the preserving of the air sweet, especially where there are sick, or numbers assembled together, calls upon us in this place to pay him that tribute of praise which his unbounded beneficence deserves. A window in each end of such buildings, and as near to the roof as can be, is, in this case, very useful; because the one admits fresh air, while the other discharges the noxious air; and this without cooling or altering the temperature of the air near the sick.

Many of these sick cattle were bled in the jugular; but that was only once, and in the very beginning of the disorder. Care was taken not to perform this operation after the signs of putrefaction had appeared. Water whitened with bran was their only nourishment. An ounce of crystal mineral was added to a pailful of this water for some; and for others the water was acidulated with vinegar, which was preferred to every other acid. Cooling glysters were not forgotten. Two of them were given daily to each of the sick animals. They were composed of leaves of mallows, of pellitory of the wall, and of mercury, of each two handfals, boiled in five pounds of common water to a consumption of one fourth. Two ounces of common honey, as
much

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much oil of olives, and one ounce of crystal mineral were added to this when strained off.

Injectiōns were also thrown up the mouth and nose two or three times a day. These were composed of the leaves of plantain, briar, and agri-mony, of each a handful, boiled half an hour in four pounds of common water, to which were added, when strained off, two drams of sal ammoniac; and sometimes in place of this salt, two ounces of oxymel squills were mixed with this liquor. The liquor thrown by a large syringe into the nose, descended into the back part of the mouth, and moistened and washed all it's parts. It was the more necessary that these parts should be well cleaned, because they generally were the parts most affected. The creatures were likewise from time to time made to snuff up the volatile spirit of sal ammoniac, and doubtless the volatile fumes penetrating into the live parts, stimulated them, and excited in them a motion, by the help of which the diseased parts exfoliated or cast off in white filaments.

The tumours which appeared externally were suppurated as speedily as possible. The ripening poultice or cataplasm used for this purpose was made of leaven with one third of basilicon. When this was thought insufficient, another was substituted in it's place, made with six bulbs of lilies roasted under the ashes of a wood fire, four ounces of white lily roots, and four handfuls of sorrel boiled in four pounds of common water, and afterwards bruised in a mortar. Two ounces of hog's lard, and a like quantity of common honey, old grease and basilicon were mixed with them; and lastly, according to the circumstances, half an ounce of galbanum dissolved in wine, and an equal quantity of gum ammoniac in powder, were added. As soon as a fluctuation

was felt in these tumours, they were opened with a knife or caustic, but most frequently with the actual cautery, to excite a more plentiful suppuration by giving the greater stimulus to the vessels. If it was not possible to open all the tumours externally, one or two glysters were immediately injected, in order to prepare the way for a purging drench, lest the matter being absorbed into the blood, might add to the already too-putrid disposition of the blood. The purging potion was composed of an ounce of the leaves of senna infused for three hours in a pound of boiling water; and in this liquor, when strained off, an ounce of bruised succotrine aloes was infused all night over hot ashes, and given to the animal warm in the morning out of a horn. This was repeated as occasion required, till the symptoms disappeared; and then the creatures were gradually brought back to their usual wholesome food.

One of the diseases which made the greatest havock, was that which, in the year 1763, left scarcely any cattle alive in the district of Brouage in the Election of Marennnes, in the Generality of Rochelle. The accurate account given of it by M. Nicolau, M. D. on the 11th of September 1763, is so full of instruction, that it ought not to be omitted here.

“ The parishes in which the distemper among the cattle exerts its greatest fury, are situated on the borders of a low country, in extent about three leagues. It was formerly laid out in salt-pits; but the communication with the sea has been since cut off, and the sea now comes no farther than the town of Brouage. The whole remains in the uneven state it was in when employed for making of salt; and the hollows and
risings

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risings still retain the appellations then given them. Some of the hollows have been in time imperfectly filled up, and others remain in nearly their former state. They are all filled with water in rainy seasons, especially during the winter; and the water, not having any outlet, stagnates till the sun and heat of the summer have evaporated it. The deepest, which seldom dry intirely, form so many pools full of aquatic plants, and, notwithstanding that, are made to serve as watering-places for the cattle. The whole forms a vast slimy marshy meadow, in which are fed numbers of cattle intended for the butcher, and for the farmer's work. It is the loss of these which has in part occasioned the misery of the inhabitants of that place.

“ These receptacles of mire spread far around foetid exhalations which infect the atmosphere, and render the inhabitants subject to intermitting putrid malignant fevers towards the end of the summer. The disagreeable smell is particularly felt at sun-rise in good weather.

“ During the spring and summer of this year, 1763, the rains have been almost incessant, and the weather constantly cool. In the greatest heat, Reaumur's thermometer, in a room facing the north, did not exceed 18 or 19 degrees (from 64 to 68 of Fahrenheit's). On the 3d of July we had a storm accompanied with hail of an uncommon size, which in many places destroyed every kind of crop, and did considerable damage to the buildings. Most of the large cattle which the disease has carried off were exposed to this storm and felt all it's violence; but the sheep and swine, to whom the distemper proves equally fatal, were under shelter. Besides, the mortality had begun before.

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“ There was great plenty of grafs, owing to the constant rains; but these have prevented it's being made into hay. Great part of it perished without being cut, or rotted after it was cut. The cattle were exposed night and day to the inclemency of the season. All the fruits both of the summer and the autumn have failed, and the trees are now [September the 11th.] in bloom, as in the spring.

“ The grasses which grew in this place did not appear to me to be unwholesome for cattle; and even if there were any such, the principal cause of the contagion ought not to be imputed to them, since the sheep which fed elsewhere, and some horses which lived on dry hay, are equally affected, as well as the swine which did not feed on it.

“ The mortality spreads to the other domestic animals, without excepting even the poultry*, which perished in a hamlet of St. Symphorian. Yet, however epidemic the disorder is, there is room to think it not contagious. Numbers of dogs died in several parishes, which had eaten of the flesh of the diseased cattle; but others which had not eaten of it died likewise, and some continued to eat daily of it without being incommoded.

“ In the month of May last [viz. in 1763.] some complaints appeared on the tongues of the horned cattle in a few contiguous parishes; but that was only a false alarm, for the complaints went off without doing any mischief. In June, and in the beginning of July, the reigning dis-

* The Royal Society of Paris observe here, that the disorder of which the poultry died in the above-mentioned village, may perhaps not have been the same as that which killed the cattle, nor produced by the same causes; for that the mortality amongst fowls was pretty general every where, and seemed to have been the consequence of a great inflammation on the breast, like that which affected the dogs.

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temper shewed itself among the sheep, and has committed such havock as not to leave one of them in some places; and in others, the few that do remain are abandoned by their shepherds and left to die, literally speaking, like rotten sheep, without any care being taken of them.

“ The mortality among the horned cattle, horses, and other animals, has been fatal principally to two parishes since the end of July. It now spreads on all sides, though with less havock in some places than in others.

“ The first symptom observed in them is their abstaining from food. I do not mean to say, that no other symptoms precede this; but the keepers of the herds, little experienced in, and as little attentive to, such objects, do not distinguish them. This prelude awakens attention. The creatures are observed to be melancholy, to hang their heads, to have cold and drooping ears, rough hair without it's usual lustre, loins fallen and beating, the belly hard and full, the whole body wreathed, and seeming to be disposed to make efforts to urine. The urine which they void is often as clear as water; it is seldomer that any thing passes by stool, and chewing of the cud ceases in the horned cattle. In a few hours after, if no tumours appear on the surface of the body, they are seized with a shivering, their eyes become dull and watery, a tough snivel issues from the mouth and nose, they lie down and die quietly, or are more or less convulsed. In this extremity they stretch their heads out frequently, pant for breath, fetch long sighs, and sometimes too they cough. These symptoms often come on so rapidly, that the creature dies before they have been seen; many bullocks have dropt down dead under the yoke. The quicker the successession of these symptoms is, the greater is

the danger. A violent shivering is always fatal. When the symptoms come on more gradually, there commonly is no shivering; but if there be, the danger is in proportion to it's violence and duration. It sometimes happens that tumours appear indifferently in all parts of the surface of the body. They sometimes remain fixed in the part where they first appeared; at other times they disappear, to shew themselves elsewhere: if they vanish intirely, the creature dies; if, on the contrary, they increase in number, and on the parts least essential to life, whilst the creature still retains it's strength, there is room to hope for a recovery. Daily experience begins to prove, that the cure depends essentially on the character of these tumours as approaching the nearest to a phlegmon, and on their good issue.

“ The tumours are not of the inflammatory kind. They seem first of all to affect the muscles. The part affected feels hard, without being much swelled. Soon after a humour insinuates itself into the cellular membrane around, which relaxes the fibres steeped in it, enervates them, and raises a lump in the skin. If it is not immediately discharged by an opening, it's stay produces a gangrene which soon spreads farther; or if the humour falls on any of the bowels necessary to life, the creature dies before the gangrene has made much progress. These tumours are flabby, and yield only a thin reddish sanies. If a suppuration comes on, all does well; the creature recovers strength, and appetite to eat. If, on the contrary, there is only a thin discharge without suppuration, the cure goes on but slowly, the creature languishes and sinks, till by the falling off of all the gangrened sloughs, the wound appears well coloured, and the cattle themselves

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themselves lick it with their tongues in order to heal it.

“ The gangrene which succeeds this tumour is of a very particular kind. The cellular membrane and the flesh seem to be rather macerated than rotten. They look of a pale colour inclining to livid; and though their fibres seem disunited, they retain a pretty firm consistence: but the slough which casts off before the cure, is black, foetid, and quite mortified. If the tumours continue long in a lax flaccid state, there is great danger of the matter's being reassumed into the blood, and consequently of it's falling the more violently on some other part. This happened to several creatures of different kinds. They died, either because the discharge was interrupted, or because it came out but imperfectly. The more sensible the diseased flesh is, the greater is the room to hope for a cure; and the more insensible it is, the greater is the danger.

“ When the tumours from being flat, as they are at first, rise higher into a round circumscribed form, becoming at the same time more firm and elastic, it is a sure sign that nature is getting the better of the disease, by changing that thin discharge into a tumour of the inflammatory kind; which being in a convenient place, always ends well. The weakness and faintness soon change for the better when these favourable signs appear. The flies of every kind, which, attracted by the smell of the sickness, settle on diseased creatures in greater numbers in proportion to their weakness and inability to shake them off, leave them likewise in proportion as their strength returns. A liveliness and desire of eating succeed their former dull state.

“ The humour contained in these tumours, shews itself sometimes from the very beginning
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to be of great acrimony, almost caustic. M. Drouhet, surgeon at Pont l'Abbé, has observed that, having opened one of these tumours on the inner and upper part of the thigh of a bullock, the humour discharged from it stripped off the hair in twenty-four hours, as if the part had been steeped in boiling water. The bare skin appeared very red and inflamed. The tumours which shew themselves on the breast of a horse are the most dangerous; and on the contrary those which are formed in the part corresponding to that which is called the dew-lap in a bullock, are the least dangerous. Those which come in the muzzle, mouth, or fundament of any creature, prognosticate the worst of events. It is in this last case in particular, that the creature, either whilst dying, or when dead, bleeds at the mouth, or nose, or fundament, and sometimes at all of these together.

“ One of the symptoms most commonly met with on the opening of the dead bodies, is a want of digestion. The whole intestinal canal is generally empty, while the stomachs are full, and as it were crammed with grass which is more or less hard in the third stomach of animals which chew the cud. This happens though they have ceased to eat for several days before their death; and even when a sudden death takes them off before they have discontinued to eat.

“ The blood taken from the sick creatures coagulates readily, and is soon covered with a thick hard crust, of a whitish colour, a little inclining to yellow. Bleeding, when properly timed, has had sensibly good effects; but when done at an improper time, the consequences have always been fatal. Most of the drenches hitherto given have seemed to hasten death, according to the

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the report of those who have made the greatest use of them.

“ Though the causes of epidemic diseases are seldom known, yet I think we may impute the disorder here spoken of to the too long continued moisture of the air, owing to constant rains, fogs, and storms, which have not ceased during the whole of this year [1763]. To this may be added, that the moisture, which had penetrated deep into the earth, may, rising again, have spread in the air uncommon exhalations, which may likewise have greatly affected the animal oeconomy. But as disquisitions of this kind lead little to the cure, I shall not dwell any longer on them.

“ This epidemic disease has so great a resemblance with what we call in man a putrid, malignant, purple and pestilential fever, that I do not scruple to give it these names in other animals. So much is it of the same stamp, that I met with three men in the country, on whom the anthrax or true pestilential buboe had appeared; probably owing to their being so much among the infected cattle. Though, for want of judicious observers among those who watch over the brute creation, we have not a regular account of the first symptoms by which the approach of the disease might be determined; yet, from the symptoms above-mentioned, there were evident signs of an inflammation in the beginning, as will appear to every intelligent reader, from the recapitulation of them here made. The violence of the fever, and the concomitant putrid disposition of the air, and also of the infection communicated, soon brought on a putrid state of all the fluids, as appears no less evidently from the symptoms already mentioned.

“ During

“ During the course of my inquiries, I found but one peasant who could give any account of the pulse. This man, examining whether any tumour yet remained in a cow, put his hand between the upper part of the fore-leg and the breast, and felt a frequent and strong pulsation of the artery, which answers to the axillary in men. The animal was then feeding; but it soon lost all desire to eat, was thereupon judged to be distempered, and died speedily after.

“ The pulsation of the arteries is easily felt in most cattle, and particularly that of the temporal, the axillary, and the crural. The carotid artery in a horse is frequently perceivable by the eye, in that part where the neck joins to the breast; and the artery may likewise be felt in that part of the leg of a horse which answers to the ankle in man; and the crural artery is easily felt in sheep.

“ The excellent Dr. Hales, who let no inquiry escape him which he thought might be of use, has given, in his *Hæmostatics*, the number of pulsations which the arteries of different animals make in a minute. He counted forty-two in a minute in a horse full grown and at rest; sixty-five in a very young colt; fifty-five in a colt three years old; forty-eight in a horse five years old, but a native of Limoges, and consequently of a country where these animals are very backward; thirty-two in an old horse; and fifty-five, sixty, and even up to an hundred in a horse whose crural artery was cut on purpose for instruction. The pulse was more frequent as the horse approached it's end. In full-grown mares he counted from thirty-four to thirty-six; which proves that the pulse is less frequent in the females than in the males, in brutes.

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brutes *. The arteries of bullocks and cows beat nearly the same as those of horses and mares. In sheep, they beat about sixty times in a minute; in dogs, about ninety-seven times. It is, however, to be observed, that the pulse is far from being uniformly the same in each species, nor even in the same animal, at all times; the frequency of pulsation frequently depending on many circumstances, such as rest, food, as well as the degree of health. The frequency of the pulse in the different species of animals may be said to be in proportion to their size, slowest in the largest animals, and quicker as they become less.

“ In the beginning of the diseases, the advice judiciously given by the Royal Veterinarian School at Lyons should be followed. Bleeding, a spare diet, acidulated and nitrous drinks, and emollient loosening glysters, will be of great service. These means may mitigate the symptoms, check the progress of the disorder, and thereby procure time to place proper remedies fit to prevent that feebleness and great degree of putrefaction which are so much to be feared. The use of the former medicines is therefore to be followed, by giving liquors which stimulate, and yet are not too acrid; and by administering cordials and such medicines as prevent the gangrenous disposition. Emetics and purgatives are, in this case, given to men; but the structure of the stomachs of cattle render the use of vomits impossible with them; and they are so hard to move by purgatives, that these become dangerous from their stimulating too much. Other animals, whose stomachs will admit of vomiting,

* This observation may be true with regard to brutes, but we think it is otherwise in women.

such

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such as dogs and swine, have been cured with the help of vomits.

“ The putrid and acrid quality of the humours which are contained in the tumours, requires their being opened as soon and as fast as they appear, be they ever so many. The longer the opening is delayed, the more the humours are corrupted. It is likewise right to draw the humour to places the least dangerous, by applying cauteries, or making setons in them, though there is not any humour in them. The parts should, at the same time, be strengthened by fomentations, such as a decoction of scordium, made in wine, and sharpened by the addition of sea-salt, or sal ammoniac. The wound should be dressed with a suppurating medicine, covered over with some plant more or less acrid, according as it seems necessary to promote a greater flow of humours, or only favour the discharge of them. Loufewort, black hellebore, root of iris, &c. answer this purpose. When the wound becomes clear, it requires no other dressing than lint and a proper digestive, or turpentine.

“ By means of this easy and plain method, people, little accustomed to the care of cattle, have preserved the lives of many; and it is to be lamented, that we have not in our country-places more expert farriers, capable of carrying on a regular method: for by that still more might be saved.

“ The cattle never appeared fatter nor in better condition than they are this year [1763]; and the disease has seemed chiefly to attack the finest and plumpest: no wonder that their owners are grieved to see them die.”

M. Nicolau next gives us an account of what was observed in the dead bodies.

“ On

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“ On the 23d of August 1763, a bullock died at about four o'clock in the afternoon, after having been slightly convulsed. His body was not swelled, nor did the disease appear by any external mark. Being opened immediately after death, the flesh appeared sound, without any offensive smell. After having cut the sternum and pleura, a small quantity of wind escaped, not at all foetid; and the mediastinum, pleura, diaphragm, heart and lungs, were in their natural state. When these viscera were removed, some blood was spilt, which was not coagulated, but in a dissolved state. The lungs had some hydatides on their surface, filled with a thin serum. Otherwise nothing extraordinary appeared either externally or internally. The tongue, mouth, and œsophagus appeared sound. In the abdomen, the cawl was found. The spleen had some gangrenous spots upon the part which touches the stomach. The bile was thin, and of a somewhat paler colour than is natural. The stomach and intestines having been torn, through the unskilfulness of the farrier, it was not possible to examine them with sufficient exactness. However, the abomasus appeared intirely sphacelated, and the villous membrane fell off so easily, that parts of it were mixed with the food, and others lay upon it.

“ A cow was observed to be sick on the 22d of August, and in the evening of the 23d we were informed that she was dying. As we were going towards her, in order to examine her, she mounted very quickly upon a high heap of dung, where she fell, and died in violent convulsions at about seven in the evening, emitting a thick slimy matter from her mouth and nose. We opened her at eight in the morning of the 24th. Her belly was swelled, owing partly to her being
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big with young, and partly to wind contained in the peritoneum. No foetid smell came from her, nor did any thing uncommon appear on the surface of her body. The skin being cut off, the cellular membrane appeared sound. The milk which issued from her udder was white, of a due consistence, and clear. The head and breast were in their natural state; but the blood, which flowed plentifully from the large vessels, was in a dissolved state, no where coagulated. A small quantity of wind, not stinking, issued from the breast and belly. The stomachs were distended; and all of them were full of grass, except the abomasus, which contained a small quantity of a muddy dark-coloured liquor. In general, the grass contained in the other stomachs was not so dry nor so much chewed as in the bullock; yet it seemed sufficiently so to render the digestion extremely difficult. All the stomachs were deprived of the wrinkled membrane which covers their inside. This membrane lay upon the food, and was partly mixed with it. Also several parts of the coat of the third stomach were destroyed, looked black, and fell in rags on the least touch. The intestines were quite empty and inflamed, as was also the mesentery. The intestines were likewise deprived of their inner villous coat, and in many places so sphacelated, that they fell to pieces on the least touch. Part of the cawl was in the same state, whilst the rest of it appeared sound. The bladder, the womb, the foetus and it's covering, and all the rest of the flesh looked well, and had no bad smell; and what is remarkable, the corrupted parts had not a very bad smell.

“ On the 28th and 29th of August, a horse was observed to be sick. The first thing that appeared was a tumour on the left side of the breast, from whence

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whence it soon extended over all the lower part of the neck. A farrier, in my presence, destroyed the skin to the flesh with a red-hot iron. The horse shewed no sign of feeling of this operation; though he was at the same time sensible of the bites of flies in other parts of his body. There was no discharge from the wound, and he died at about five in the afternoon of the 31st. We opened him early the next morning. He stunk, and his belly was swelled. On the opening, a quantity of very stinking air issued out: all the bowels were in their natural state, excepting some traces of inflammation. The stomach only was full of hay, though the creature had not eaten for three days before his death. The intestines were empty. The pericardium contained a great quantity of lymph a little bloody, in which the heart seemed drowned; it's basis was drenched, loose, and as if macerated in it. All the fore-part of the neck from the breast to the jaw, that is to say, all the tumour, appeared under the skin to be only a mass of fibres, some white, others livid, all macerated and drenched in a mucilaginous lymph, resembling a discharge from the nose, a little tinged with blood. The flesh all around was likewise very moist and livid; but elsewhere it was sound.

“ A sheep, yet warm, was found on the 2d of September. The skin between the legs, where it is not covered with wool, was speckled with red and purple spots. There was under it's throat, between the two branches of the lower-jaw, a tumour bigger than one's fist; and, upon opening it, there issued out a great deal of tawny serum, with which all the cellular membrane around, under the skin and between the muscles, was filled. It reached as far as the base of the brain, which was likewise steeped in it. There ap-

peared no sign of gangrene elsewhere. The rest of the body was sound, both within and without, excepting that the intestines were empty. The three last stomachs were not too full; but the omasus, or first stomach, contained a great deal of grass. The liver had in it some old schirruses, which seemed not to have any relation with the disease of which the creature died. The gall-bladder was of it's natural colour, as well as the bile. The spleen was swelled, and stuffed with black blood

“ On the 7th of September, we examined six dead sheep. The five first had no other symptom on the external parts of their bodies, than purple spots on the places free from wool. The sixth had many more; besides which, it discharged blood from the nose and fundament; which last was swelled all round. We opened this sheep. The head and all the rest of the body were sound and free from inflammation. The first stomach, called *omasus*, was distended, and stuffed with grass; the second stomach contained less of it in proportion; the third stomach had but little in it, and that somewhat hardened; the fourth contained a muddy liquor of a dark green colour; it's coats were red, and it's wrinkles a little gangrened. The intestines contained excrements, the cellular membrane around the anus was full of serum, and the veins were filled with clotted blood.”

Dr. Nicolau's above-recited account of the distemper having been presented to the Veterinarian School, this highly-useful society gave accordingly their opinions thereon, to the following effect, and the Royal Society of Paris have published it, in order to afford every help in their power in so great a calamity, in case the like should happen again.

In

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In this consultation, they agree with Dr. Nicolau as to the causes of the disease, and are of opinion, that it consists in a perversion of all the humours, and in a relaxation, inaction, and stupor of the solids.

“ As to the tumours which appeared externally, they should, say they, with manifest reason, certainly be looked upon as a salutary crisis; especially when there yet remained strength enough in the solids, to throw the vitiated humours on the part where the obstruction had begun, and by that means so far free the rest of the mass of blood.

“ Even the sound cattle in so unwholesome a country as the district of Brouage, above described, carry in them the seeds of the disorder, and therefore the first attention should be directed to their preservation. As to correcting the bad qualities of the air and water, enough has been already said on that head, as well as of purifying the places into which the sound cattle are to be put. Particular care should be taken that their food be wholesome; and if it be dear, it may be given in less quantity: for it is better that the cattle become lean, than that they die. Running water should be got for them, if possible: but if they drink standing water, vinegar should be mixed with it, or red-hot irons may be quenched in it. It should, if possible, be boiled; and the following preservative may be given them.

“ Take two handfuls of juniper-berries, bruise them, and let them infuse twenty-four hours in a quart of wine-vinegar; give half a pint of this liquor morning and evening. Repeat this remedy once or twice a week, even to the animals which appear perfectly sound. As to

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those in which the least sign of sickness appears, give them the following medicine :

“ Take Peruvian bark in powder, and filings of steel, of each two drams; one dram of sal ammoniac; mix them in half a pint of wine, or in the same quantity of a strong decoction of juniper-berries in water, and give this with a horn every morning and evening for a week.

“ In the cure of the diseased, bleeding seems rather a thing to be avoided; for it inevitably increases the loss of strength, the inaction of the solids, and thereby hastens the putrefaction of the fluids. As it is evident, by the opening of dead bodies, that the digestion is much vitiated, no solid food should be given to the sick animals: but, dissolve rock-alum in bran and water, in such quantity that the creature may take half an ounce of it in a day; and give, as soon as possible, the following medicine :

“ Take gum ammoniac and assa-foetida, of each half an ounce, rub them in a pint of vinegar till they are dissolved; strain the solution, if any dirt be mixed with the gums, and give it as warm as the creature can bear it for several days, only once a day.

“ In case the symptoms are so urgent, that there is not time to make the foregoing solution, give half a table-spoonful of volatile spirit of sal ammoniac, in half a pint of wine, or of infusion of juniper-berries, and do this three times a day. If a sweat breaks out, it should be kept up with an ounce of theriac or orvietan, dissolved in the same kind of vehicle. With this view, the animal should be covered, and towards the end of the crisis strongly rubbed down.

“ The critical tumours require the utmost attention. As soon as there is the least appearance of them, every means should be used to draw them

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them outward. On those which are hard at the bottom, and shew no disposition to suppurate, cataplasms the most capable of exciting the action of the solids, and of increasing the inflammation in the part, should be applied. Epispastic or blistering applications answer this purpose.

“ Take half an ounce of cantharides, two drams of euphorbium, both in powder, mix them with half a pound of leaven, and vinegar enough to make them of the consistence of a cataplasm or poultice, which keep twelve hours on the swelled part, and repeat it, if the tumour is not in a state to be opened.

“ As soon as the least fluctuation, or even a softness only, is felt, it should be opened, rather with the actual cautery than with a cutting instrument; and a knife made red-hot is better than a button cautery. The tumour must be laid open from one end to the other, and as deep as the seat of the matter. The wound may be dressed with digestive and unguentum *Ægyptiacum*, equal parts of each; and at every dressing, that is, twice a day, the part must be washed with a mixture of one quart of common water, a pint of brandy, and two drams of sea-salt.

“ The rotten parts being cast off, and the suppuration become kindly, the wound may be dressed with the common digestive, made of turpentine dissolved in the yolk of an egg, oil of St. John’s-wort, and brandy.

“ And finally, the bad symptoms being all gone, and the wound being nearly healed, it will be necessary to give some purging medicine, which must be repeated *pro re nata*. This may be done with safety.”

The Royal Society of Agriculture at Paris have likewise given an account of a Peripneumony, which constantly attacks the horned cattle

every year, in the latter end of autumn, and the beginning of the spring, in several parts of France, and particularly in the Franche-Comté. It is known there by the name of *Murie*; and the following is the account given of it's symptoms.

A dry cough, which at first comes but seldom, but is afterwards much more frequent; a sensible degree of fever; an oppression more or less troublesome, which increases when the animal has eaten, and which sometimes ceases, though this is very rare; a distaste to food, which increases with the disease: creatures which chew the cud, cease that chewing; but this sign is equivocal, because the same happens to them in all severe illnesses. A stinking breath; a dryness of the nose, mouth, and tongue; and sometimes a discharge of matter by the nose, different in it's degree of thickness: but the three last of these symptoms do not always happen.

Those which are observed in the dead bodies are, a lividness and stuffing of the lungs, an echimosis on their surface, suppurated pustules, gangrenous spots on the surface, as also gelatinous crusts of different colours, which adhere slightly to it; purulent abscesses, the matter of which insinuates itself into and wastes the lobes of the lungs, sometimes of one only, and at other times of both; an adhesion to the pleura, which is sometimes thick, inflamed, suppurated, or gangrened; a considerable quantity of reddish, purulent, putrid, sometimes frothy sanious water is found in the breast.

A sinking, a feebleness, a great difficulty of breathing, a continual cough, a redness of the eyes, a dryness of the tongue, a rattling in the throat, a stinking breath, are symptoms of an approaching

approaching death; as the being free from them affords hope of recovery.

The most common causes of this disorder are, the changes in the atmosphere from heat and drought to cold continued rains, to which the animals are exposed; or their being suddenly turned out from warm houses into wet cold air.

The cure must begin with bleeding in the jugular, taking a considerable quantity of blood, and repeating it on the same day, as also on the second and third, if the disease runs high. When the blood does not coagulate, but remains fluid and without cohesion, it indicates that the lungs are then so much stuffed and obstructed, that only the thinnest parts of it can pass to the heart, and that farther bleeding cannot be of service.

Emollient and refreshing glysters given and repeated two or three times a day for the first five or six days, have very good effects. No solid food should be given to the sick cattle, at least very little, or but just enough to support them. The best food that can be given them is wheaten flour, either mixed with warm water, or made into balls with honey, and given from time to time. Their drink should be bran and water, with honey dissolved in it; or an infusion may be made of the flowers of corn-poppies and violets, of each two handfuls, in boiling barley-water, to which may be added three ounces of honey: this mixture should be added to the former.

Rolls or pellets put into the creature's mouth two or three times a day will have very good effects. They may be made of six flat figs sliced and mashed, with five ounces of common honey and conserve of roses; or of four ounces of syrop of violets, the yolks of six eggs, five ounces of rose-water, and as much flour as to form pellets. Making the sick creature breathe from time to
time

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time the fumes of warm water in such manner that those fumes enter with the air into the lungs, is found to give great relief.

When the cough is very hard, frequent, and greatly fatigues the animal, the following bolus may be given, besides the addition made to the common drink. Take spermacæti and liquorice in powder, of each two grains, pillulæ de cynoglossa one dram, and mix them up with conserve of althæa into a bolus.

If the fever and oppression abate, the following bolus may be given in the morning fasting. Take agaric in powder, flowers of sulphur, Florentine iris in powder, of each two drams, and make it into a bolus with honey.

If the sinking and putridity, the natural consequences of a great inflammation, still continue, give the following bolus; viz. flowers of sulphur six drams, spermacæti two drams, powder of wood-lice, gum ammoniac, of each a dram and an half, myrrh one dram, white honey as much as is necessary to render them of a proper consistence to be made into two boluses, to be given at two different times. The Peruvian bark, camphire and honey may be used to advantage. To this end, take of Peruvian bark three drams, of camphire one dram, and of simple oxymel as much as shall be sufficient to make them into a bolus, to be given in the morning fasting, and in two hours after, one or two hornfuls of a strong decoction of juniper-berries, or of elecampane. In case there be a defluxion from the nose, the following drink may be given; viz. leaves of periwinkle, of lion's-foot, of fluellin, of ground-ivy, of each a handful, which boil in common water till one third is evaporated, and to the strained liquor add four ounces of honey, to be given at two different times:

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times: and now the first bolus with the flowers of sulphur need be given only in the evening. This last drink is peculiarly useful in that malignant peripneumony which frequently spreads among cattle. This distemper is, however, not contagious, as some have thought it, and is, so far as can be judged, that which affected the horses, poultry, and dogs, in 1764, and again the horses in particular in 1766.

The cure may be finished by one or two purging glysters made as follows. Take leaves of fenna three ounces, pour upon them too pounds and a half of a boiling emollient decoction, let them infuse for an hour, strain off the liquor, and dissolve in it three ounces of catholicon, for a glyster: but this should not be given till the dangerous symptoms have disappeared, and a chewing of the cud shews a return of the stomach's being able to do it's office in animals which chew the cud.

As the influence of the air is greater in this disease than in almost any other, the sick creatures should not be exposed to cold or rain. The buildings in which they are kept should be neither too warm nor too cold, but had better of these two exceed in coolness. The air should be frequently renewed, and if the disorder is epizoonic, the air should be fumigated by throwing from time to time a small quantity of vinegar upon live coals.

As to the means of preserving cattle from it, the sound should be separated from the sick, and sheltered as much as possible from the causes of the disorder; a small quantity of blood may be taken from them; they should be kept covered, their common drink should be bran and water boiled, and emollient glysters may be given in
case

case the least tendency to the disorder be perceived.

The Royal Society of Agriculture at Paris close their observations on particular diseases omitted by Dr. Barberet, author of the Memoir to which they adjudged their prize for the year 1765, and of which the greatest part of the foregoing is an abstract, with an account of the dysentery, a disease which frequently attacks only particular horses, and which sometimes becomes general and even contagious among them. In this last case, it is always malignant, is constantly attended with a fever, in the beginning light, but which afterwards becomes so high as frequently to be thought the principal disease. Its symptoms are, sanious, purulent, bloody stools; griping, tenesmus, an enormous heat of the entrails, a falling out of the fundament, &c. together with all those which indicate a fever attended with malignity. On opening the dead bodies, the intestines are generally found dry, or dilated with wind, containing a purulent matter, and always with signs of inflammation, ulcerated or gangrened: the spleen is inflamed and putrid, the rectum especially is in the worst state of any of the bowels, and clots sometimes of pure blood, sometimes mixed with sanies, are found in it.

If the sick horse is not too much sunk with the disorder, it is adviseable to bleed him in the jugular. An ounce of oil of olives or of rape, mixed with half a glass of wine-vinegar and a glass of water, may be given morning and evening. The common drink should be bran-water, with one third of a decoction of burnt hartshorn: the food should be only barley, oats, or rye, boiled. An ounce of diascordium mixed with bran-water acidulated with vinegar, may be given at times.

Glysters

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Glysters will be peculiarly beneficial. To this end, take of wheat-bran four handfuls, leaves and flowers of mullein of each one handful, seeds of fenugreek and of flax of each half an ounce. The bran, leaves, and seeds, should be boiled in five pounds of water to a diminution of one third. At the close of the boiling, the flowers should be added, and let stand to infuse. Two candles should be melted in the strained liquor for a glyster. In case the gripings are violent, a glyster may be made of the same decoction, with, instead of the candles, three ounces of syrop of diacodium, and half an ounce of ippecacuanha in powder. This glyster has surprizingly good effects. Towards the close of the disorder, the following deterfive glyster may be given. Take leaves of millepertuis and of periwinkle, of each a handful; boil them in the same quantity of water as before directed, and to the same degree of diminution; and to the strained liquor add two ounces of Venice turpentine dissolved in the yolks of eggs, for a glyster.

Nitre and camphire are frequently given with good success. Take an ounce of nitre, dissolve it in two pounds of decoction of sorrel, and give it at twice with a horn: or, take nitre and camphire, of each two drams, and make them into a bolus with a sufficient quantity of honey.

T H E E N D.

A
S Y S T E M
O F
PRACTICAL HUSBANDRY.

Fellow of the Royal Society of London, Honorary Member of the Dublin Society, of the Royal Societies of Agriculture at Paris and Rouën, of the Oeconomical Society of Berne, and of the Palatine Academy of Sciences and Belles-Lettres.

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POSTSCRIPT.

The learned and judicious PETER LAYARD, of Huntington, M. D. and F. R. S. whose residence in the country, joined to his universal humanity, necessarily afforded him frequent opportunities to remark the beginning and progress of the contagious Distemper which prevailed among the Horned-Cattle in this kingdom a few years ago, particularly from about the year 1765 to 1770; being then applied to by Government for his advice, gave the following as the result of many carefully repeated observations he had made on that melancholy occasion *.

SYMPTOMS.

“THE first appearance of this infection is a decrease of appetite; a poking out of the neck, implying some difficulty of deglutition; a shaking of the head, as if the ears were tickled; a hanging down of the ears, and deafness; a dulness of the eyes; and a moving to and fro, in a constant uneasiness. All these signs, except the last, increase till the fourth day: then ensue a stupidity and unwillingness to move, great debility, a total loss of appetite, a running at the

* These valuable Instructions were so *carefully mislaid*, amongst other papers relative to quite different subjects, that the most diligent search for them, in every place but that where they were, proved ineffectual whilst this Volume was printing. Accident brought them to light, after it was quite finished at the Press; and it is hoped this will be admitted as an excuse for the rather irregular manner of subjoining them here.

eyes and nose, sometimes sickness and throwing up of bile, a husky cough, and shivering. The fever, which was continual the three first days, now rises, and increases towards the evening: the pulse is all along quick, contracted, and uneven. A constant diarrhæa, or scouring of foetid green fæces, a stinking breath, a nauseous steam from the skin, infect the air in which the morbid creatures are placed. Their blood is very florid, hot, and frothy: their urine is high-coloured: the roof of the mouth and the bars are ulcerated. Tumours, or boils, are to be felt under the fleshy membrane of the skin; and eruptions appear all along their limbs, and about their bags. If a new milch-cow is thus ill, her milk dries up gradually, her purging is more violent, and on the fourth day she is commonly dry. There is such sharpness in the dung of the diseased, that a visible irritation is observed during some time in their fundament. They groan much, are worse in the evening, and mostly when they lie down. These symptoms continue increasing till the seventh day, on which, generally, though sometimes protracted till the ninth, the crisis, or turn, takes place.

“ Bulls and oxen are not so violently attacked as cows and calves; and of these, cows with calf, and weakly cow-calves, are in the greatest danger.

“ If a cow with calf, at the critical time of this disease, slips her calf, she then takes her fodder, and recovers. Some may only give signs of such abortion, and bear their calf several days, nay even weeks, before they slip it, and yet recover. Calves receive the infection from the cow, by sucking her milk; and may also, if first seized, infect the cow.

" This disease takes place at all times and seasons: but in summer and autumn it will rage most. The fate of the beast is generally determined on the seventh day from the invasion; though it has been sometimes delayed till the ninth.

" If eruptions appear all over the skin, or boils as big as pigeons eggs in different parts of the body, but especially from the head to the tail, along each side of the back-bone, and so ripe as to discharge putrid and stinking matter; if large abscesses are formed in the horns, or in any part of the body; if the dung is become more consistent and firm; if the urine is thick, and not quite so high-coloured as before; if the beast has had a shivering, succeeded by a general glow of heat, upon which the fever has abated, and the pulse beats regularly; if the nose be sore or scabbed; if the eyes look bright and brisk, and if the beast pricks up it's ears upon a person going into the hovel, and will eat a little hay or peas; these symptoms will determine that the creature is out of danger.

" But if, on the seventh day, the eruptions, or boils, are decreased in bulk, or have totally disappeared without having broke or discharged outwardly; if the scouring continue almost constantly; if the breath be very hot, while the whole body, limbs, and horns are cold; if the groaning and difficulty of breathing are increased; if the running from the nose and eyes is lessened; if the eyes are dim, and sunk into the head, with a perfect stupidity; if the urine is dark-coloured, the pulse intermitting, and a cadaverous smell is observed; we may assuredly pronounce the creature to be near it's end.

" Ramazzini's emphysema was met with.

“ All the carcasses that were opened appeared extenuated by the scouring. Upon opening the skin, much stinking air rushed out, and sometimes a purulent and sanious discharge. The vessels of the brain were turgid, and filled with blood of a very red colour and loose texture; the ventricles filled with water. The membranes of the nose, the glands, the whole extent of the frontal sinus, and the pith of the horns, were highly inflamed, ulcerated, and full of small abscesses. There was the same appearance in the mouth, and about the glands of the throat. The lungs were inflamed with livid sphacelated spots, here and there loaded with hydatides; and the cellular texture was frequently distended with air. The heart was large, flabby, and dark-coloured, containing in it's ventricles clots of black blood, of a very loose texture, without serum; the fat about it was of a bright yellow. The liver was large: it's blood and biliary vessels were fully extended with dark fluid blood, and very deep-coloured bile: the substance of the liver was so rotten, as to separate on the least touch. The gall-bladder was stretched to a great size, and full of greenish bile. The æsophagus was ulcerated in some. The paunch was distended with air, flabby, and contained a large substance like a dried turf, consisting of fodder hardened to that degree. There were several appearances of gangrene on all the stomachs. The honeycomb had no fluid in it, but some pappy fodder. The manyfold contained, between it's plaits, a great deal of dried fodder, which clung to their sides. The rennet-bag was empty, but highly inflamed, and gangrened in several places. All the intestines were empty, and were beset with red and black spots. The kidneys and bladder were large, without urine. The kidneys were
of

of a loose texture, easily torn. The flesh in some was livid, in others of a lively red; but it soon turned green. The fat that remained was of a bright yellow. In such cows as were with calf, the uterus was gangrened in several places, and the water included in it stunk most intolerably. The virulence of the disease appeared to have sometimes fixed itself on the vital part, and sometimes on another, and frequently in more places than one.

T O C U R E.

“ The beasts should be kept in well-aired houses, and be plentifully bled, from two quarts to one, according to their age and strength. They should be washed with warm water and vinegar, to clear the skin from filth, and be frequently rubbed, which affords them much pleasure, as well as benefit. A rowel should be made as soon as possible in the dewlap, and it should be kept open for some time after the cure. If the dung be hard, a cooling purge should be given, and plenty of anti-septic drinks, such as bran-water, vinegar, bitters, salt; but no hay till they chew the cud. The mouth, barbs, and nostrils, should be washed carefully and frequently. If a purging comes on by the fourth day, it should be checked by warm medicines proper to throw the morbid matter off by the skin, such as snake-weed, and other warm plants, or Venice-treacle, with which Mr. Montgomery * cured six beasts out of seven. If the colour of the mouth becomes dark, the creature cold, the dung black and foetid, and the discharge from the mouth and nose sanious, an

* One of the Doctor's neighbours in the country.

ounce of Jesuits-bark, or oak-bark, with snake-root, or other warm ingredients, should be given every four hours, to prevent mortification. If matter is formed in the horns, or any other part of the body, an opening should be made there, as also in the emphysema, and digested by warm applications. If a purging does not come naturally after the crisis, the bowels should be emptied with a smart purge, after which a draught of warm ale may be given at night. On recovery, the beasts should be gradually exposed to cold air, and by degrees habituated to their usual food."



F I N I S.

ERRATA.

- Page 7, line 23, 24. dele when it is named*
 45, l. 30, *after that add the*
 85, l. 2, *after particular add care*
 91, l. 17, *after be add put*
 133, l. 9, *for imparted read impacted*
 144, l. 10, *and 148, l. 29, for Servier read Serviez*
 204, l. 2; p. 206, l. 28; p. 209, l. 28; p. 215, l. 28; p. 221, l. 14, *for Sharpe read Sharp*
 235, l. 28, *dele in and after of add the*
 247, l. 33, *after but add it*
Page 302, l. 20, an inadvertent repetition of what had been remarked before in page 87
 334, l. 2, *for like read likewise*
 374, l. 1, *for milleperthus read millepertuis*
 377, l. 21, *dele must*
 389, l. 5, *after sheep add that are not fatting*
 399, l. 22, *for being read is*
 436, l. 7, *after plant add and, l. 8, dele and the millefoil*
 445, l. 33, *for salprenel read sal-prunel*
 471, l. 24, *for seldomer read seldom*
 489, l. 12, *for too read two.*



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ADDITIONAL ERRATA.

- Page 85. *l.* 13. for bred, read breed.
ibid. *l.* 34. dele water.
 93. *l.* 16. for distempers, read diseases.
 139. *l.* 7. for thus, read then.
 238. *l.* 29. for alternative, read alterative.
 246. *l.* 20. after of, dele the.
 268. note, *l.* 1. after not, add all.
 269. note, *l.* 7. for split, read slit.
 278. note, *l.* 7. for credit, read believe.
 289. note, *l.* 1. for the, read an.
l. 1. dele the commas after oak and after snake-ropt.

